

User Manual LON M-Series

Version 1.11



Moers, 22/01/2013

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1. Introduction

Thank you for choosing a spega product. This product has been designed and optimised for use in building automation. To learn what the device can do and how to operate it, we recommend that you read this handbook carefully. It tells you all you need to know about how the device works, how to assemble it and how to set its parameters.

Please keep this manual in a place that is accessible to all users!

1.1. Explanations of pictograms used

This guide uses pictograms as warning symbols, to make it easy to handle the equipment safely and get it working fully.



VOLTAGE: indicates immediate danger of a harmful electric shock if disregarded. This could result in severe or fatal injuries (to persons).



WARNING: indicates other immediate dangers if disregarded. This could result in severe or fatal injuries (to persons).



CAUTION: indicates a source of danger which could lead to property or environmental damage if disregarded.



INFORMATION: indicates recommendations for use which must always be followed to guarantee smooth operation. Failure to observe these, however, will not result in damage to the equipment.

1.2. Use of the manual

This manual is intended for all groups of persons involved in the planning, installation, commissioning and maintenance of the system. A overview of which chapter is relevant for which group of persons is shown below.

	Introduction	Product description	Applications	Setting-up and configuring a device	General handling of the plug-ins	Device templates - interfaces
Owners	✓					
Planners	✓	✓	✓			
Electrical specialists	✓	✓				
Systems integrators	✓	✓	✓	✓	✓	✓

2. Product description

The LON M-series modular system comprises a sistema MC LON universal controller and one or more modular actuators which can be used together in almost any configuration. The controller is the intelligent interface between the LON network and the modular actuators.



Device plug-ins and plug-ins for the function objects are provided for the detailed configuration of the modular system.



Figure 1: M-series actuators with max. 24 channels which can be freely combined

2.1. Safety information

Please note the following safety information:



The device function is determined by the application program. Only programs which have been by released by spega for the device may be loaded.



The system installer must ensure that the application program and the related parametrization conform to the wiring and intended application of the device.



The relevant standards, directives, requirements and regulations of the respective country must be observed when installing electrical equipment.

2.2. Order information

Order #	Product	Description
121 000 C	<i>sistema MC</i>	LON Universal controller for M/R series modular actuators
110 008	<i>lumina BE8</i>	Binary input 8 ports for floating contacts (e.g. window contacts, dew point or occupy sensors)
120 104	<i>lumina SA4</i>	switch actuator 4 channels
120 105	<i>lumina SA4-b</i>	same as lumina SA4, but with additional manual control option
120 108	<i>lumina SA8</i>	switch actuator 8 channels
120 109	<i>lumina SA8-b</i>	same as lumina SA8, but with additional manual control option
120 144	<i>lumina ST4</i>	1-10V control outputs for 4 channels
120 145	<i>lumina ST4-b</i>	same as lumina ST4, but with additional manual control option
120 164	<i>lumina DAL4</i>	DALI Controller for control and supply of 64 DALI devices in 4 groups
120 168	<i>lumina DAL8</i>	DALI Controller for control and supply of 64 DALI devices in 8 groups
120 166	<i>lumina DAL16</i>	DALI Controller for control and supply of 64 DALI devices in 16 groups
120 202	<i>ombra BA2</i>	Sunblind actuator 2x230V AC with interlocking contacts
120 203	<i>ombra BA2-b</i>	same as ombra BA2, but with additional manual control option
120 232	<i>ombra BA2-3E</i>	Sunblind actuator 2x230V AC with interlocking contacts for motors with 3 limit switches
120 233	<i>ombra BA2-3E-b</i>	same as ombra BA2-3E, but with additional manual control option
120 204	<i>ombra BA4</i>	Sunblind actuator 4x230V AC with interlocking contacts
120 205	<i>ombra BA4-b</i>	same as ombra BA4, but with additional manual control option
120 214	<i>ombra BA4_DC</i>	Sunblind actuator 4x24V DC with pole-reversing output for 4 DC motors
120 215	<i>ombra BA4_DC-b</i>	same as ombra BA4_DC, but with additional manual control option
120 254	<i>ombra BA4-SMI</i>	Sunblind actuator 4 x SMI
120 255	<i>ombra BA4-SMI-b</i>	Sunblind actuator 4 x SMI with additional manual control option
120 258	<i>ombra BA8-SMI</i>	Sunblind actuator 8 x SMI
120 259	<i>ombra BA8-SMI-b</i>	Sunblind actuator 8 x SMI with additional manual control option
120 256	<i>ombra BA16-SMI</i>	Sunblind actuator 16 x SMI
120 257	<i>ombra BA16-SMI-b</i>	Sunblind actuator 16 x SMI with additional manual control option
120 264	<i>ombra BA4-SMI-LoVo</i>	Sunblind actuator 4 x SMI-LoVo for low voltage motors
120 265	<i>ombra BA4-SMI-LoVo-b</i>	Sunblind actuator 4 x SMI-LoVo for low voltage motors with additional manual control option
120 268	<i>ombra BA8-SMI-LoVo</i>	Sunblind actuator 8 x SMI-LoVo for low voltage motors

Order #	Product	Description
120 269	<i>ombra BA8-SMI-LoVo-b</i>	Sunblind actuator 8 x SMI-LoVo for low voltage motors with additional manual control option
120 266	<i>ombra BA16-SMI-LoVo</i>	Sunblind actuator 16 x SMI-LoVo for low voltage motors
120 267	<i>ombra BA16-SMI-LoVo-b</i>	Sunblind actuator 16 x SMI-LoVo for low voltage motors with additional manual control option
110 058	<i>clima AE8-P</i>	Analog input, 8 channels for passive temperature sensors
120 344	<i>clima AA4-10V</i>	Analog I/O module, 4 channels, with individually configurable input/outputs for 0-10V/4-20mA sensors or actuators
120 348	<i>clima AA8-10V</i>	Analog I/O module, 8 channels, with individually configurable input/outputs for 0-10V/4-20mA sensors or actuators
120 324	<i>clima AA4</i>	Digital output, 4 channels, for 4 thermoelectric or 2 motor driven actuators (24VAC / 230VAC)
120 328	<i>clima AA8</i>	Digital output, 8 channels, for 8 thermoelectric or 4 motor driven actuators (24VAC / 230VAC)
120 332	<i>clima LA2-3</i>	Multi stage switch, 230VAC, interlocking contacts, 2 X 3 stages, to control two 3-speed fans
120 333	<i>clima LA2-3-b</i>	<i>same as clima LA2-3</i> , but with additional manual control option
120 354	<i>clima AA4-MP</i>	MP-Bus actuator 4-Channels
120 358	<i>clima AA8-MP</i>	MP-Bus actuator 8-Channels

2.3. *sistema MC*



The LON Universal-Controller sistema MC is the intelligent interface between the LON network and spega M series modules.

It controls up to 24 channels, which can be freely combined from the corresponding spega actuators.

2.3.1 Technical data sistema MC

Power Supply

Operating voltage	24V DC (20...27V DC)
Current consumption (w/o modules)	typ. 40mA (1,0W)
Current sourcing (to modules)	max. 800mA
Power dissipation (w/o modules)	2,7W

Network

Network type	TP/FT-10 (78kbps)
Transceiver type	FTT

Inputs/Outputs

Actuator interface	Control interface for spega modules
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Connections

Network / Power supply	4-pin plug-in terminal connection for Ø 0,6 - 1,0mm (sol.), four bus lines can be connected to each pin
Actuator interface	integrated 14-pin socket

Control elements

Service push button	Sends Neuron-ID when pressed
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Indicators

Service LED	ON: no application loaded FLASCHING: unit not configured
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Housing

Protection	IP 20 (DIN 40050 / IEC 144)
Dimensions	85(45) x 35 x 60 (H x B x T) – corresponds to 2 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail

Ambient conditions

Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level

Safety

Electrical isolation
Protection class

SELV (EN 60 950)
III (IEC 536 / VDE 106 Teil1)

Standards

Device safety
Immunity
Certification

gem. EN 50 090-2-2
gem. EN 50 090-2-2
CE

2.3.2 Mounting sistema MC

1. Installation on DIN EN50022 rail, width 2 TE
2. The connection interface for spega actuators is located on the right-hand side of the housing. The Controller must only be operated with spega e.control actuators. Observe the maximum space available on the DIN rail.



Switching inductive loads (for example contactors or electric motors) can produce powerful high frequency interferences, which may affect the functionality of this or other units. It is therefore recommended to install snubber circuits (e.g. RC snubber) on the outputs. Please refer to the manufactures of the connected loads for more information.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.



The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.3.3 EMC-compliant cabling within the building

As a rule, all legal standards and directives governing the design of cabling must be observed. By adhering to the following information regarding cabling installed in buildings, devices may be protected against electromagnetic interference, particularly in the case of high EMC loads.

Laying of different cables

Motor cables, power supply cables and general feed cables for sub-distribution boards and system distributors are cables which may interfere with bus cables, extra-low-voltage cables and general signal lines and control cables. Consequently, both these categories of cable must always be laid separately. In cases where cable junctions cannot be avoided, the cables should ideally be laid at right angles to each other.

Selecting a bus cable

When selecting the LON bus cable the installation instructions for LON networks - the Echelon Wiring Guidelines - must be observed at all times. In addition, the use of twisted pairs for the cable types specified must be ensured. When using J-Y(St)Y or comparable cable types, we recommend the use of the green EIB cable.

Shielded cables have better EMC properties than non-shielded cables. A proper earthing system is a basic requirement for an EMC-compliant installation. It must be ensured that no equipotential bonding current can flow across the shields of data or bus cables.

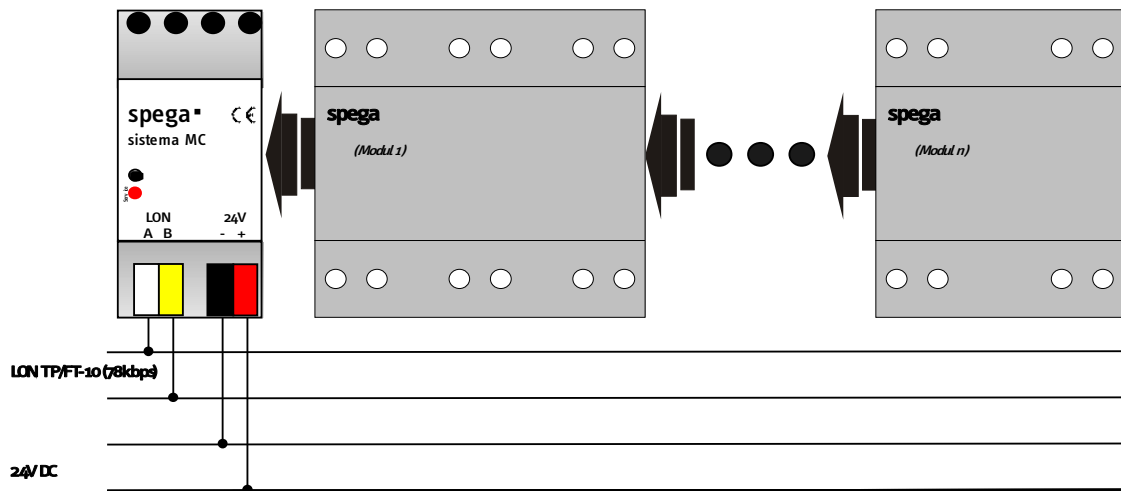
Power supply lines

24V power supply lines must be designed such that the voltage drop on the line is no more than 2 volts. The maximum power consumption of all connected devices should be taken as a basis for this. Please note that both current-carrying conductors must be taken into account when calculating the line resistance. These supply lines must not be routed in the same cable together with mains cables.

Signal lines

Stranded pairs of cables must be used for connecting digital and analog sensors. These signal lines must not be routed in the same cable together with mains cables.

2.3.4 Connecting sistema MC



The LON Universal-Controller sistema MC implements a LON TP/FT-Transceiver. The operating voltage is 24V DC. Spega LON M-series modules can be connected to the controller using the 14-Pin Actuator interface.

2.3.5 Operation and Indicators sistema MC

For commissioning, a service push button and a service LED are located on the front of the unit. The neuron ID is sent by pressing the button. A sticker with the neuron ID (in barcode and written form) is also attached to the housing, allowing for a spatially separated integration.

To configure the actuator channels, use the relevant LNS plug-in (to be found on the e.control CD or on the Internet under <http://www.spega.com>).

2.4. lumina BE8



The lumina BE8 binary input can be connected to spega M/R series LON controller.

Together with the spega M/R series LON controller the connection between the LON network and conventional electrical switches or floating contacts is provided.

The binary input has 8 self-supplied inputs, which can be configured independently.

With the binary input it is possible to use conventional switch products for switching or dimming lights or electrical loads, for controlling all types of sunblinds, for saving and retrieving light scenes or for reading floating contacts, e.g. occupancy sensors or window contacts.

2.4.1 Technical data lumina BE8

Power supply

Operating voltage DC	via spega M/R series LON controller
Current consumption (typ., contacts closed)	60mA (1,4W)
Power dissipation (max.)	1,4W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Digital inputs	8 inputs for floating contacts, 24V DC, 5mA current source

Connections

Actuator Interface	integrated 14 pin connector
Digital inputs	9 x 1pin terminal screw connection, Ø up to 4mm ² , cables extendible for up to 100m (using twisted and shielded cables)

Housing

Protection	IP 20 (DIN 40050 / IEC 144)
Dimensions	85(45) x 70 x 60 (H x B x T) – corresponds to 4 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail

Ambient conditions

Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level

Safety

Electrical isolation	SELV (EN 60 950)
Protection class	III (IEC 536 / VDE 106 Teil1)

Standards

Device safety	gem. EN 50 090-2-2
Immunity	gem. EN 50 090-2-2
Certification	CE

2.4.2 Mounting lumina BE8

1. Installation on DIN EN50022 rail, width 4 TE
2. This unit can only be connected to floating contacts. During installation of cables please observe possible minimum distances to other cables in order to maintain a safe isolation.
3. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Input circuits must obey SELV (Safety Extra Low Voltage) specifications.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

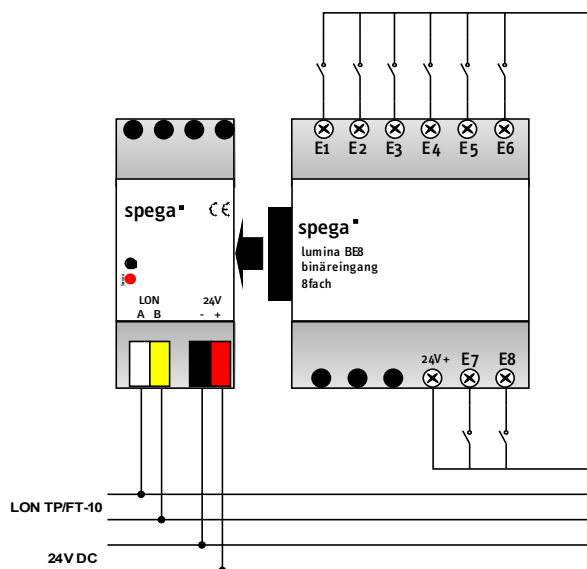


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.4.3 Connecting lumina BE8



2.5. lumina SA4



The lumina SA4 switching actuator is designed for connection to spega M/R series LON controller. The maximum switching capacity for each channel is 16A. The switching channels allow greater peak making currents and are therefore suitable for operating electronic ballasts. There are separate supply cables for all channels.

The switching actuator can be operated in conjunction with other e.control actuators for lighting or sunblinds together on one controller.

In the SA4-b version, the actuator has a manual control level, allowing the device to be switched on or off independently of the bus, as well as LEDs for indicating the output state.

For configuration purposes, an easy LNS plug-in is available for the controller.

2.5.1 Technical data lumina SA4

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	110mA (2,6W)
Power dissipation (max.)	5,2W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Switching outputs	4 isolated relay outputs, switching capacity 16A / 250V, high starting currents are permissible (120A / <20ms)
switching capacity (applicable to > 10 ⁴ cycles of operation)	3000 W tungsten incandescent lamps 1500 VA fluorescent lamps, corrected, cos ϕ = 1 2500 W HV halogen lamps

Connections

Actuator Interface	integrated 14 pin connector
Switching outputs	8 x 1pin terminal screw connection, $\varnothing$ up to 4mm ²

Control elements

lumina SA4	-
lumina SA4-b:	3-stage rotary switch for each channel. Functions: „off“, „bus“, „on“

Indicators

lumina SA4	-
lumina SA4-b:	status LED ON: channel on OFF: channel off

Housing

Protection	IP 20 (EN 60529)
Dimensions	85(45) x 52,5 x 60 mm (H x W x D) – corresponds to 3 modular spacings

Type/location of installation distribution board, 35mm DIN mounting rail

Ambient conditions

Operating temperature -5°C ... +45°C
 Storage temperature -25°C ... +55°C
 Transport temperature -25°C ... +70°C
 Relative humidity 5% ... 93% (w/o condensation)
 Installation height up to 2000 m above sea level

Safety

Electrical isolation SELV (EN 60950)
 Protection class II (DIN EN 61140, VDE 0140-1)

Standards

Device safety EN 50090-2-2
 Immunity EN 50090-2-2
 Certification CE

2.5.2 Mounting lumina SA4

1. Installation on DIN EN50022 rail, width 3 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Switching inductive loads (for example contactors or electric motors) can produce powerful high frequency interferences, which may affect the functionality of this or other units. It is therefore recommended to install snubber circuits (e.g. RC snubber) on the outputs. Please refer to the manufactures of the connected loads for more information.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

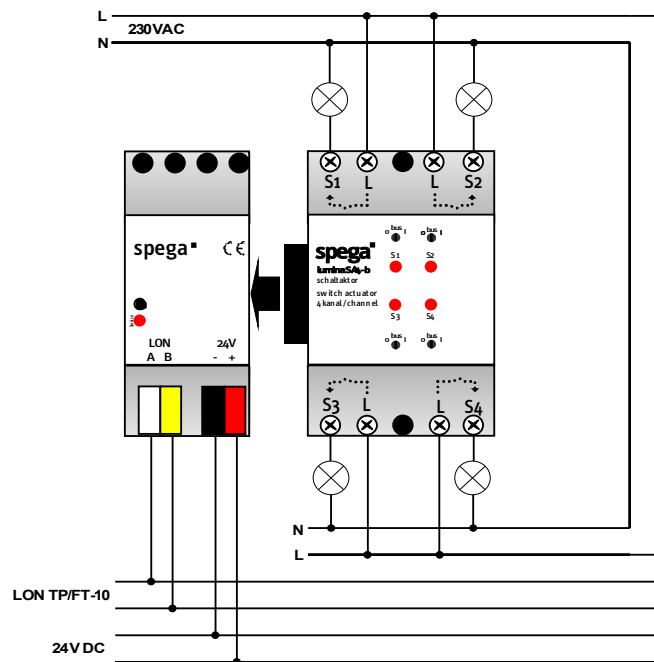


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.5.3 Connecting lumina SA4



2.5.4 Operation and Indicators lumina SA4

lumina SA4:

no control and indicator elements.

lumina SA4-b:

Each channel can be manually switched on or off using a rotary switch installed on the front.

left position: Channel is switched off. Bus control is switched off.

right position: Channel is switched on. Bus control is switched off.

middle position: Bus control is switched on.

The logical channel state is displayed by a LED.



The logical channel state may not be the same as the physical state of the output relay!

2.6. lumina SA8



The lumina SA8 switching actuator is designed for connection to spega M/R series LON controller. The maximum switching capacity for each channel is 10A. The switching channels allow greater peak making currents and are therefore suitable for operating electronic control gears. There are separate supply cables for every two channels.

The switching actuator can be operated in conjunction with other e.control actuators for lighting or sunblinds together on one controller.

In the SA8-b version, the actuator has a manual control level, allowing the device to be switched on or off independently of the bus, as well as LEDs for indicating the output state.

For configuration purposes, an easy LNS plug-in is

available for the controller.

2.6.1 Technical data lumina SA8

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	200mA (4,8W)
Power dissipation (max.)	7,7W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Switching outputs	8 isolated relay outputs, switching capacity 10A / 250V, high starting currents are permissible (120A / <20ms)
switching capacity (applicable to > 10 ⁴ cycles of operation)	2000 W tungsten incandescent lamps 1000 VA fluorescent lamps, corrected, cos ϕ = 1 1700 W HV halogen lamps

Connections

Actuator Interface	integrated 14 pin connector
Switching outputs	12 x 1pin terminal screw connection, $\varnothing$ up to 4mm ²

Control elements

lumina SA8	-
lumina SA8-b:	3-stage rotary switch for each channel. Functions: „off“, „bus“, „on“

Indicators

lumina SA8	-
lumina SA8-b:	status LED ON: channel on OFF: channel off

Housing

Protection	IP 20 (EN 60529)
Dimensions	85(45) x 70 x 60 mm (H x W x D) – corresponds to 4 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail
Ambient conditions	
Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level
Safety	
Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)
Standards	
Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.6.2 Mounting lumina SA8

1. Installation on DIN EN50022 rail, width 4 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Switching inductive loads (for example contactors or electric motors) can produce powerful high frequency interferences, which may affect the functionality of this or other units. It is therefore recommended to install snubber circuits (e.g. RC snubber) on the outputs. Please refer to the manufactures of the connected loads for more information.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

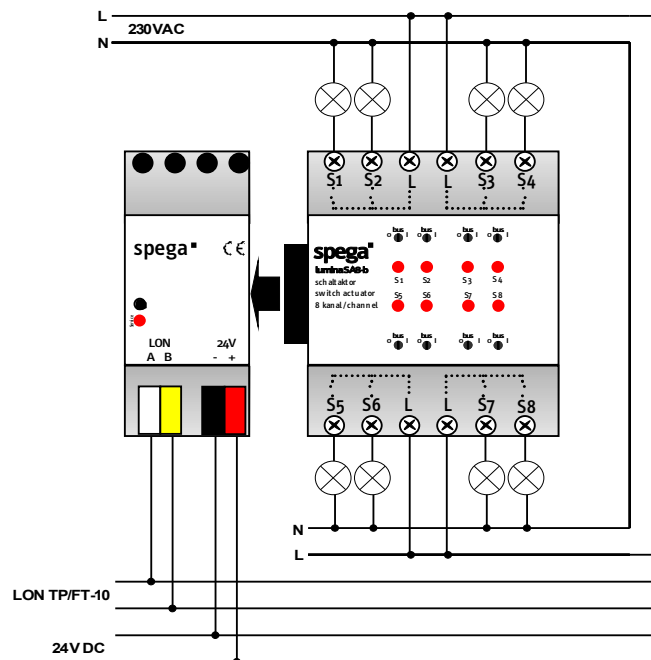


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.6.3 Connecting lumina SA8



2.6.4 Operation and Indicators lumina SA8

lumina SA8:

no control and indicator elements.

lumina SA8-b:

Each channel can be manually switched on or off using a rotary switch installed on the front.

left position:	Channel is switched off. Bus control is switched off.
right position:	Channel is switched on. Bus control is switched off.
middle position:	Bus control is switched on.

The logical channel state is displayed by a LED.



The logical channel state may not be the same as the physical state of the output relay!

2.7. lumina ST4



The lumina ST4 control output is designed for connection to spega M/R series LON controller. The actuator has four analog and relay outputs each and independently controls devices with a 1-10V interface (dimmable electronic control gears, electronic transformers etc.). The maximum current load of the analog outputs is 40mA. The relays have a switching capacity of 10A.

The control output can be operated in conjunction with other e.control actuators for lighting or sunblinds together on one controller.

In the ST4-b version, the actuator has a manual control level, allowing the device to be switched on or off independently of the bus, as well as LEDs for indicating the output state.

For configuration purposes, an easy LNS plug-in is

available for the controller.

2.7.1 Technical data lumina ST4

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	typ. 160mA (4,0W)
Power dissipation (max.)	5,0W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Analog outputs	4 analog outputs 1-10V, current sink, max. 40mA
Switching outputs	4 isolated relay outputs, switching capacity 10A / 250V, high starting currents are permissible (120A / <20ms)
switching capacity (applicable to > 10 ⁴ cycles of operation)	2000 W tungsten incandescent lamps 1000 VA fluorescent lamps, corrected, cos φ = 1 1700 W HV halogen lamps

Connections

Actuator Interface	integrated 14 pin connector
Analog/switching outputs	12 x 1pin terminal screw connection, Ø up to 4mm ²

Control elements

lumina ST4	-
lumina ST4-b:	3-stage rotary switch for each channel. Functions: „off“, „bus“, „on“

Indicators

lumina ST4	-
lumina ST4-b:	status LED ON: channel on

	OFF: channel off
Housing	
Protection	IP 20 (EN 60529)
Dimensions	85(45) x 70 x 60 mm (H x W x D) – corresponds to 4 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail
Ambient conditions	
Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level
Safety	
Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)
Standards	
Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.7.2 Mounting lumina ST4

1. Installation on DIN EN50022 rail, width 4 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Switching inductive loads (for example contactors or electric motors) can produce powerful high frequency interferences, which may affect the functionality of this or other units. It is therefore recommended to install snubber circuits (e.g. RC snubber) on the outputs. Please refer to the manufactures of the connected loads for more information.



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Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

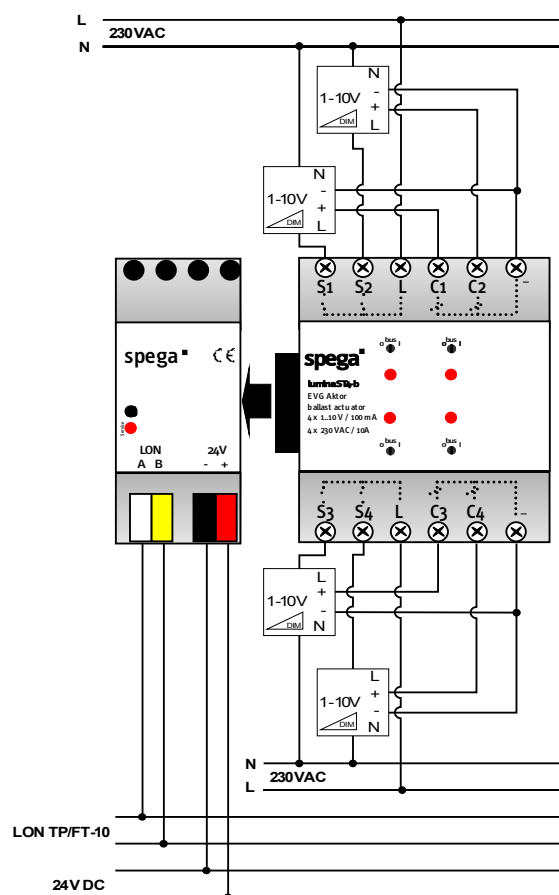


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.7.3 Connecting lumina ST4



The minus (-) terminals of the ST4/ST4-b are internally connected with each other!

2.7.4 Operation and Indicators lumina ST4

lumina ST4

no control and indicator elements.

lumina ST4-b

Each channel can be manually switched on or off using a rotary switch installed on the front.

The third switch position is used for enabling the channel for activation via the controller. When manually switching the device on, the analog output voltage is set to 10V, in order to achieve maximum brightness.

Each channel has an LED for indicating the position of the relay (On = relay switched on).

2.8. lumina DAL4/8/16



The LON DALI-Controller DAL16 is designed for connection to up to 64 DALI-electronic ballasts in max. 16 groups, lumina DAL8 can control 8 groups, lumina DAL4 controls 4 groups. The DALI-devices can be supplied via the internal power supply or via an external DALI power supply.

The controller can be tested and controlled via front-panel switches without prior software configuration. This feature makes it possible to switch on or off all devices manually right after having connected them.

All set-up and maintenance functions (e.g. group definition, test or replacement) can be done via the build-in serial interface or via the LON-network by a LNS-Plug-in. A software tool for Windows-PCs and Windows Mobile-PDAs is available for this purpose.

The software application includes light actuator objects according to LONMARK™ profile „Lamp Actuator (3040)“. All light channels can be configured with adjustable ON/OFF switching delay or stairway lighting functions. Each lamp group has its own scene memory. In the optional selectable stairway light functionality is an integrated turn-off pre-warning implemented. Due to a priority interpretation central commands can override local commands.

A failure of illuminants or DALI-devices is detected by the software and is signalled via the LON-network.

A comfortable LNS-Plug-in and a commissioning software tool (using the serial interface) for Windows 2000/XP/Vista or Mobile 5.0 are available.

2.8.1 Technical data lumina DAL4/8/16

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	typ. 200 mA (4,8W) (with internal DALI supply) typ. 45 mA (1,1W) (with external DALI supply)
Power dissipation (max.)	3,3W (with internal DALI supply) 1,5W (with external DALI supply)

Inputs/Outputs

Actuator interface	Control interface for spega modules
DALI Bus connection	16 V DC (not SELV), max. 125 mA (internal DALI-PS) DAL16: max. 64 DALI units (< 2mA), controllable in max. 16 groups DAL8: max. 64 DALI units (< 2mA), controllable in max. 8 groups DAL4: max. 64 DALI units (< 2mA), controllable in max. 4 groups
Serial interface	RS232 (ANSI/EIA/TIA-232-F-1)

Connections

Actuator Interface	integrated 14 pin connector
DALI Bus connection	2 x 1pin terminal screw connection, Ø up to 4mm ²
Serial interface	9-pin Sub-D socket

Control elements

switch CONF	- (not used)
switch MAN	manual control
Indicators	
LED CONF	configuration state and error state
LED MAN	operating state and error state
Housing	
Protection	IP 20 (EN 60529)
Dimensions	85(45) x 70 x 60 mm (H x W x D) – corresponds to 4 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail
Ambient conditions	
Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level
Safety	
Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)
Standards	
Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.8.2 Mounting lumina DAL4/8/16

1. Installation on DIN EN50022 rail, width 4 TE
2. When using an external DALI power supply, the internal power supply must be configured as “switched off”. This can be done with the configuration/installation software.
3. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.



The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

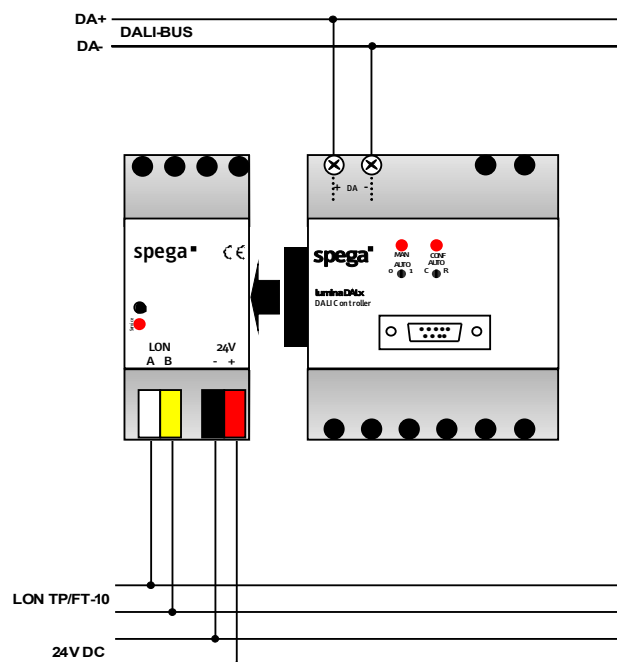
2.8.3 Connecting lumina DAL4/8/16



Electrical devices must be assembled and installed by trained personnel only.

Connecting to the LON universal controller

The LON universal controller uses an LON TP/FT transceiver for connecting to the LON network. The nominal operating voltage is 24VDC.



DALI bus connection

DALI components are directly connected to the spega DALI controller. The integrated DALI power supply of the controller can power the connected DALI devices (16V, max. 125 mA when using the internal DALI-PS).



Before using DALI devices with an external DALI power supply, the internal DALI power supply of the controller must be switched off by using the plug-in or configuration software.

DALI

DALI components are connected in parallel. With the exception of a ring topology every connection topology is usable. The maximum overall cable length (depending on the wire cross section) is limited to 300 meters.

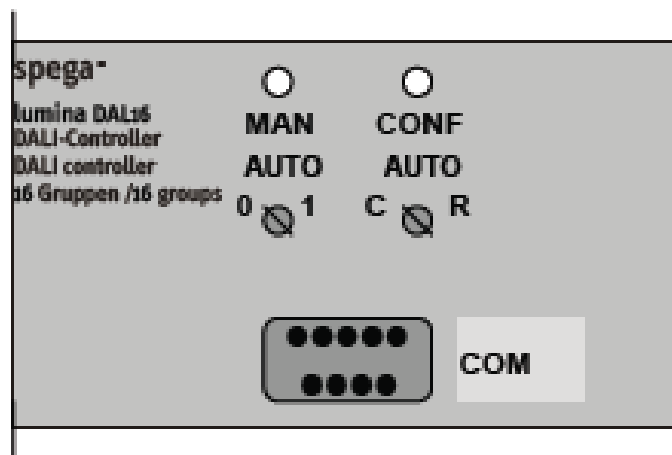
Connection test

For checking the wiring and for switching the light during construction the rotary switches on the front of the spega DALI controller can be used.

Sequence: *Step 1: Mount and connect the DALI controller lumina DAL16/DAL8/DAL4 and the other DALI components.*
 Step 2: Use manual control rotary switches.

2.8.4 Operation and Indicators lumina DAL4/8/16

Controls of lumina DAL4/8/16



Manual control is not usable if the configuration software, the plug-in or an error active.

The CONF switch is not used by the current firmware. The LED CONF displays the current state of the DALI controller:

LED	Description
off	Unit has no tool configuration.
green	Normal operation without any errors
green / red (alternating @ 1Hz)	DALI bus error (short circuit, no power supply)

The MAN switch is used to manually control the connected DALI units:

Position	Function	Description
0	Switch all connected DALI units off.	Only those units are switched which are known by the DALI controller
AUTO	automatic	automatic control by LON network.
1	Switch all connected DALI units on.	Only those units are switched which are known by the DALI controller

The LED MAN displays the current state of the unit. The flashing frequency is about 1 Hz:

LED	Description
green / red (alternating)	Unit has no tool configuration.
green	automatic control by LON network.
green (flashing)	An error occurred during automatic control: ballast error, lamp error, missing short address, power supply failure, unit does not respond, to many units connected.
red	manual control, MAN switch in position 1 or 0.
red (flashing)	An error occurred during manual control: ballast error, lamp error, missing short address, power supply failure, unit does not respond, to many units connected.

Manual control

Manual control of all connected DALI units is done via the MAN switch.

To switch all lamps on, switch MAN to position “1”, and to switch all lamps off, switch to position “0”. To return to automatic control, switch MAN to position “AUTO”

2.9. ombra BA2



for the controller.

The ombra BA2 sunblind actuator is designed for connection to spega M/R series LON controller. The maximum switching capacity for each output is 250W. The relay outputs are interlocked against one another. There are separate supply terminals for each motor channel.

The sunblind actuator can be operated in conjunction with other e.control actuators for lighting or sunblinds together on one controller.

In the BA2-b version, the actuator has a manual control level, allowing the blind to be raised or lowered independently of the bus operation, as well as LEDs for indicating the direction of travel of the blind.

For configuration purposes, an easy LNS plug-in is available

2.9.1 Technical data ombra BA2

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	40 mA (1W)
Power dissipation (max.)	1 W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Switching outputs	2 X 2 relay outputs , interlocking contacts, nominal voltage max. 250V, switching capacity 250W (AC-3 load)
Output load vs. number of operation cycles	250 W at > 2 * 10 ⁵ operations 130 W at > 5 * 10 ⁵ operations 80 W at > 10 * 10 ⁵ operations

Connections

Actuator Interface	Integrated 14 pin connector
Switching outputs	6 x 1pin terminal screw connection, Ø up to 4mm ²

Control elements

ombra BA2	-
ombra BA2-b:	3-stage rotary switch for each channel. Functions: „down“, „bus“, „up“

Indicators

ombra BA2	-
ombra BA2-b:	status LED: „down“ and „up“

Housing

Protection	IP 20 (EN 60529)
Dimensions	85(45) x 52,5 x 60 mm (H x W x D) – corresponds to 3 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail

Ambient conditions

Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level

Safety

Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)

Standards

Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.9.2 Mounting ombra BA2

1. Installation on DIN EN50022 rail, width 3 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Switching inductive loads (for example contactors or electric motors) can produce powerful high frequency interferences, which may affect the functionality of this or other units. It is therefore recommended to install snubber circuits (e.g. RC snubber) on the outputs. Please refer to the manufactures of the connected loads for more information.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

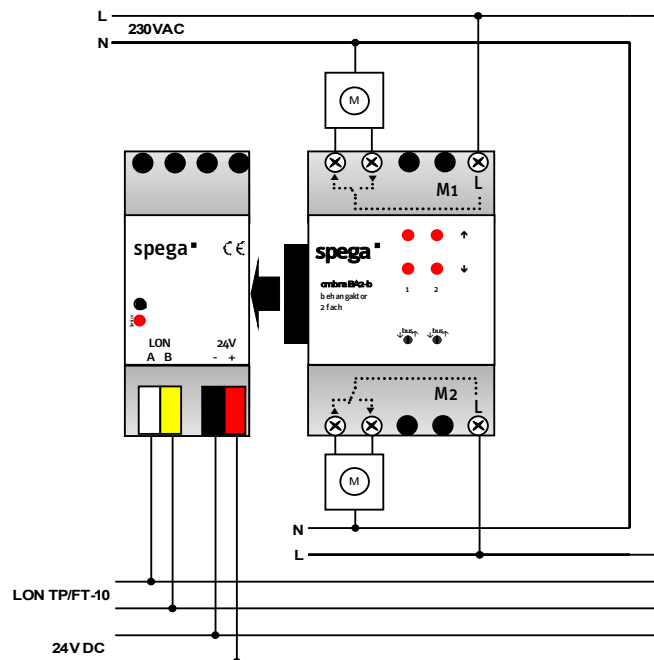


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.9.3 Connecting ombra BA2



2.9.4 Operation and Indicators ombra BA2

ombra BA2:

no control and indicator elements.

ombra BA2-b:

Each motor can be manually switched to go down or up using a rotary switch installed on the front.

- | | |
|-------------------------|--|
| left position: | Motor travels down. Bus control is switched off. |
| right position: | Motor travels up. Bus control is switched off. |
| middle position: | Bus control is switched on. |

The logical channel state is displayed by a LED.



The logical channel state may not be the same as the physical state of the output relays!

2.10. ombra BA2-3E



The ombra BA2-3E sunblind actuator can be used for sunblinds with 3 stop positions.

The actuator is designed for connection to spega M/R series LON controller.

The maximum switching capacity for each output is up to 250W. The relay outputs are interlocked against each another. There are separate supply terminals for each motor channel.

The sunblind actuator can be operated in conjunction with other e.control actuators for lighting or sunblinds together on one controller.

In the BA2-b version, the actuator has a manual control level, allowing the blind to be raised or lowered independently of the bus operation, as well as LEDs for indicating the direction of travel of the blind.

For configuration purposes, an easy LNS plug-in is available for the controller.

2.10.1 Technical data ombra BA2-3E

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	40 mA (1W)
Power dissipation (max.)	1 W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Switching outputs	2 X 3 relay outputs , interlocking contacts, nominal voltage max. 250V, switching capacity 250W (AC-3 load)
Output load vs. number of operation cycles	250 W at > 2 * 10 ⁵ operations 130 W at > 5 * 10 ⁵ operations 80 W at > 10 * 10 ⁵ operations

Connections

Actuator Interface	Integrated 14 pin connector
Switching outputs	8 x 1pin terminal screw connection, Ø up to 4mm ²

Control elements

ombra BA2-3E	-
ombra BA2-3E-b:	3-stage rotary switch for each channel. Functions: „down“, „bus“, „up“ (End position of “down” command can be configured)

Indicators

ombra BA2-3E	-
ombra BA2-3E-b:	status LED: „down“, „down2“ and „up“

Housing

Protection	IP 20 (EN 60529)
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Dimensions	85(45) x 52,5 x 60 mm (H x W x D) – corresponds to 3 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail
Ambient conditions	
Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level
Safety	
Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)
Standards	
Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.10.2 Mounting ombra BA2-3E

1. Installation on DIN EN50022 rail, width 3 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Switching inductive loads (for example contactors or electric motors) can produce powerful high frequency interferences, which may affect the functionality of this or other units. It is therefore recommended to install snubber circuits (e.g. RC snubber) on the outputs. Please refer to the manufactures of the connected loads for more information.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

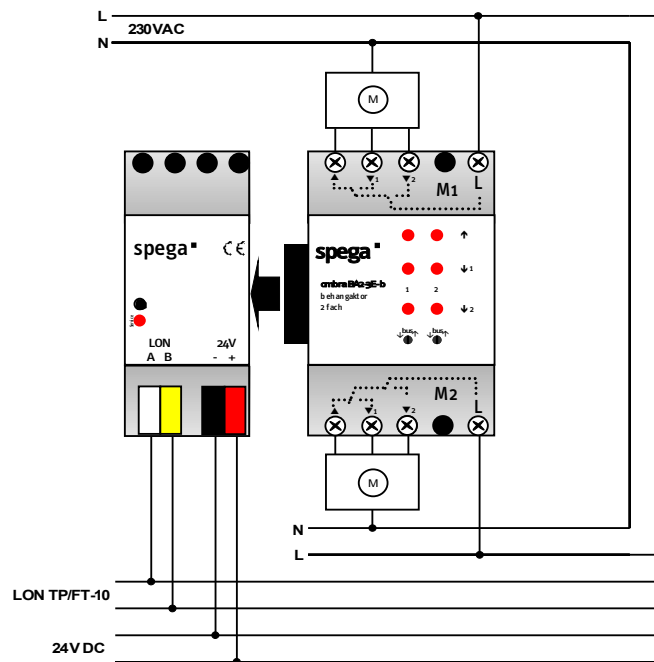


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.10.3 Connecting ombra BA2-3E



2.10.4 Operation and Indicators ombra BA2-3E

ombra BA2-3E:

no control and indicator elements.

ombra BA2-3E-b:

Each motor can be manually switched to go down or up using a rotary switch installed on the front.

- left position:** Motor travels down. Bus control is switched off.
- right position:** Motor travels up. Bus control is switched off.
- middle position:** Bus control is switched on.

The logical channel state is displayed by a LED.



The logical channel state may not be the same as the physical state of the output relays!

2.11. ombra BA4



The ombra BA4 sunblind actuator is designed for connection to spega M/R series LON controller. The maximum switching capacity for each output is up to 250W. The relay outputs are interlocked against one another. There are separate supply terminals for each motor channel.

The sunblind actuator can be operated in conjunction with other e.control actuators for lighting or sunblinds together on one controller.

In the BA4-b version, the actuator has a manual control level, allowing the blind to be raised or lowered independently of the bus operation, as well as LEDs for indicating the direction of travel of the blind.

For configuration purposes, an easy LNS plug-in is available for the controller.

2.11.1 Technical data ombra BA4

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	60 mA (1,4W)
Power dissipation (max.)	1,5 W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Switching outputs	4 X 2 relay outputs , interlocking contacts, nominal voltage max. 250V, switching capacity 250W (AC-3 load)
Output load vs. number of operation cycles	250 W at > 2 * 10 ⁵ operations 130 W at > 5 * 10 ⁵ operations 80 W at > 10 * 10 ⁵ operations

Connections

Actuator Interface	Integrated 14 pin connector
Switching outputs	12 x 1pin terminal screw connection, Ø up to 4mm ²

Control elements

ombra BA4	-
ombra BA4-b:	3-stage rotary switch for each channel. Functions: „down“, „bus“, „up“

Indicators

ombra BA4	-
ombra BA4-b:	status LED: „down“ and „up“

Housing

Protection	IP 20 (EN 60529)
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Dimensions	85(45) x 70 x 60 mm (H x W x D) – corresponds to 4 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail
Ambient conditions	
Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level
Safety	
Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)
Standards	
Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.11.2 Mounting ombra BA4

1. Installation on DIN EN50022 rail, width 4 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Switching inductive loads (for example contactors or electric motors) can produce powerful high frequency interferences, which may affect the functionality of this or other units. It is therefore recommended to install snubber circuits (e.g. RC snubber) on the outputs. Please refer to the manufactures of the connected loads for more information.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

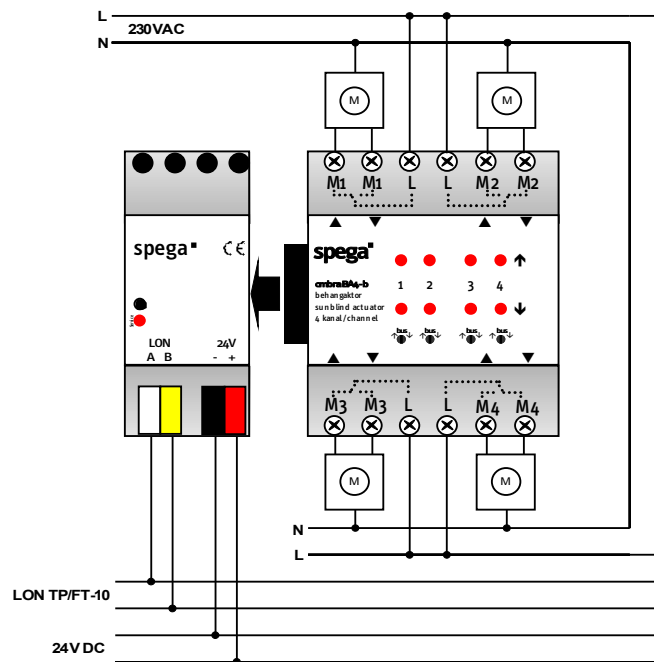


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.11.3 Connecting ombra BA4



2.11.4 Operation and Indicators ombra BA4

ombra BA4:

no control and indicator elements.

ombra BA4:

Each motor can be manually switched to go down or up using a rotary switch installed on the front.

- left position:** Motor travels down. Bus control is switched off.
- right position:** Motor travels up. Bus control is switched off.
- middle position:** Bus control is switched on.

The logical channel state is displayed by a LED.



The logical channel state may not be the same as the physical state of the output relays!

2.12. ombra BA4-DC



The ombra BA4-DC sunblind actuator is designed for connection to spega M/R series LON controller. The maximum switching capacity for each DC-motor is 1A.

The sunblind actuator can be operated in conjunction with other e.control actuators for lighting or sunblinds together on one controller.

In the BA4-DC-b version, the actuator has a manual control level, allowing the blind to be raised or lowered independently of the bus operation, as well as LEDs for indicating the direction of travel of the blind.

For configuration purposes, an easy LNS plug-in is available for the controller.

2.12.1 Technical data ombra BA4-DC

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	110 mA (2,6W)
Power dissipation (max.)	2,8 W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Switching outputs	4 X 2 relay outputs, 1A, pole-reversing output for 4 DC motors
Output load vs. number of operation cycles	1A inductive load, at > 1 * 10 ⁵ cycles of operation

Connections

Actuator Interface	Integrated 14 pin connector
Switching outputs	12 x 1pin terminal screw connection, Ø up to 4mm ²

Control elements

ombra BA4-DC	-
ombra BA4-DC-b:	3-stage rotary switch for each channel. Functions: „down“, „bus“, „up“

Anzeigeelemente

ombra BA4-DC	-
ombra BA4-DC-b:	status LED: „down“ and „up“

Housing

Protection	IP 20 (EN 60529)
Dimensions	85(45) x 70 x 60 mm (H x W x D) – corresponds to 4 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail
Ambient conditions	
Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level
Safety	
Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)
Standards	
Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.12.2 Mounting ombra BA4-DC

1. Installation on DIN EN50022 rail, width 4 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Switching inductive loads (for example contactors or electric motors) can produce powerful high frequency interferences, which may affect the functionality of this or other units. It is therefore recommended to install snubber circuits (e.g. RC snubber) on the outputs. Please refer to the manufactures of the connected loads for more information.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

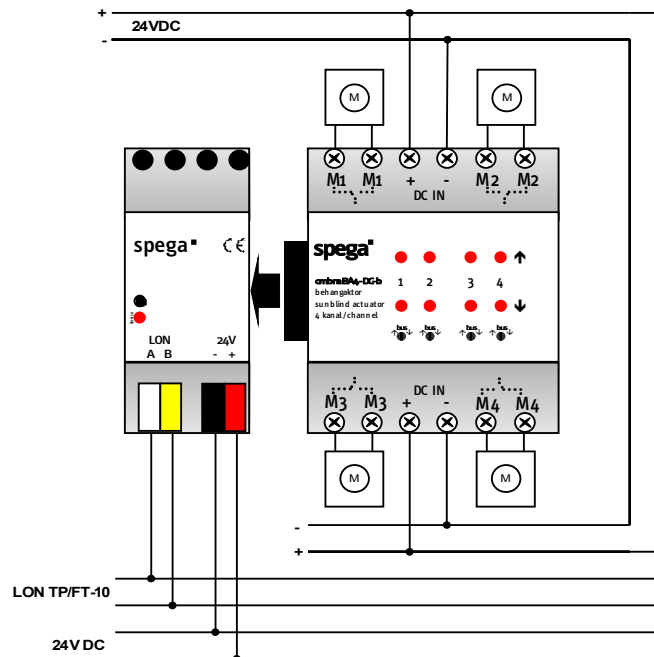


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.12.3 Connecting ombra BA4-DC



2.12.4 Operation and Indicators ombra BA4-DC

ombra BA4-DC:

no control and indicator elements.

ombra BA4-DC:

Each motor can be manually switched to go down or up using a rotary switch installed on the front.

- left position:** Motor travels down. Bus control is switched off.
- right position:** Motor travels up. Bus control is switched off.
- middle position:** Bus control is switched on.

The logical channel state is displayed by a LED.



The logical channel state may not be the same as the physical state of the output relays!

2.13. ombra BA4/BA8/16-SMI



The ombra BAxx-SMI (standard motor interface) series LON sunblind actuators can be used with spega M/R series LON controller.

Up to 16 SMI motors can be connected to the actuator, which has four independent SMI channels.

The SMI-Interface allows for precise positioning of SMI motors. Diagnostic and position reports can be read by the controller and transmitted over the LON network.

Because of its precise positioning SMI motors are very well suited for sophisticated sunblind concepts like sun tracking slat angle control of venetian blinds.

A comfortable LNS plug-in is included, that can be used for configuring / commissioning of the actuator.

ombra BA16-SMI series

ombra BA16-SMI series actuators are capable of controlling motors in up to 16 groups. Group membership is independent of the SMI channel to which the motor is connected (individual addressing).

ombra BA8-SMI series

ombra BA8-SMI series actuators are capable of controlling motors in up to 8 groups. Group membership is independent of the SMI channel to which the motor is connected (individual addressing).

ombra BA4-SMI series

ombra BA4-SMI series actuators are capable of controlling motors in 4 groups. Group membership is tied to the SMI channel to which the motor is connected.

low voltage motors (LoVo)

All actuators of the ombra BAxx-SMI series are also available in a SMI-LoVo variant suited for controlling low voltage (24VDC) SMI motors.

manual control (-b)

The actuators are also available in a variant with manual control elements and LED status indicators (-b).

2.13.1 Technical data ombra BA4/BA8/16-SMI

Power supply

Operating voltage DC	via spega M/R series LON controller
Current consumption DC	typ. 15 mA (0,4W) DC, max. 50mA (1,2W) DC (manual control option)
Operating voltage AC	230VAC ($\pm 10\%$)
Current consumption AC	typ. 1,5 VA
Power dissipation	1,9 W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Motor interface, 230V SMI variants	4 x SMI Interface (common I- line) A total of 16 SMI 230VAC motors can be connected.
Motor interface, SMI-LoVo variants	4 x SMI Interface (common I- line) A total of 16 SMI-LoVo motors can be connected.

Connections

Actuator Interface SMI	integrated 14 pin connector 4 x 2pin terminal screw connection, $\varnothing$ up to 4mm ²
Power supply AC	1 x 2pin terminal screw connection, $\varnothing$ up to 4mm ²

Control elements

w/o manual control option	-
with manual control option	3-stage rotary switches for 4 channels. Functions: „down“, „bus“, „up“

Indicators

w/o manual control option	-
with manual control option	Multi color status LED for every SMI channel / rotary switch

Housing

Protection	IP 20 (EN 60529)
Dimensions	85(45) x 70 x 60 mm (H x W x D) – corresponds to 4 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail

Ambient conditions

Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level

Safety

Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)

Standards

Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.13.2 Mounting ombra BA4/BA8/16-SMI

1. Installation on DIN EN50022 rail, width 4 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.



The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

Actuators of the ombra BAxx-SMI series have four logically independent SMI channels. SMI commands send for instance via channel 1, cannot be received by units connected to the other three channels.

The four channels are interconnected with each other through the I- communication line. There is a maximum of 16 SMI motors per actuator that can be controlled, independently of how the motors are distributed over the SMI channels. If there are more than 16 motors connected to the actuator, then this is signaled as an error.

Depending on the actuator series type the connected motors are differently administered by the actuator.

Motor groups and slat angle control

All SMI motors of a group are controlled in parallel. Therefore they must consist of identical motors and connected to mechanical identical blinds.

Identical blinds in the sense of this manual must have identical mechanics and identical blind lengths. The end positions must also be set identical.



Different blind mechanics, blind lengths or end positions of blinds within a single group can cause slat angles not to be moving synchronously with each other!



The accuracy of the slat angle control depends largely on the accuracy of the blind mechanics.

2.13.3 Connecting ombra BA4/BA8/16-SMI

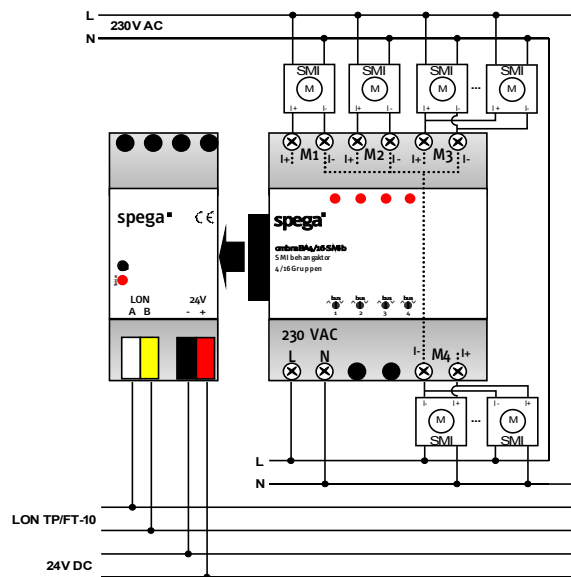


Image 2: 230V SMI actuator connection

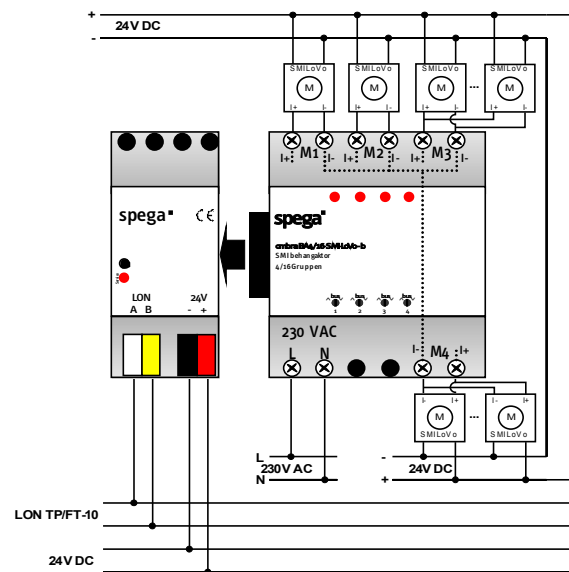


Image 3: SMI-LoVo actuator connection



230VAC SMI motors are only allowed to be connected to 230VAC SMI actuators and not to SMI-LoVo actuators!

All SMI 230VAC motors must be connected to the same mains phase!

SMI-LoVo motors are only allowed to be connected to SMI-LoVo actuators!

Under no circumstances is it allowed to connect SMI-LoVo motors and SMI 230VAC motors to the same actuator!



Disregard may lead to danger of short circuit, fire or injuries!

SMI Components are connected in parallel. With the exception of a ring topology, all topologies are allowed. The maximum length of the SMI bus is limited to 350 meters.

2.13.4 Operation and Indicators ombra BA4/BA8/16-SMI

Introduction

The slat angle of blinds depends on its move history. A SMI motor knows only positions and has no knowledge of slat angles. The actuator therefore derives the current slat angle from the last motor movements and then keeps track of the current angle.

Because of the above the slat angle is usually not known after a reset or loss of supply voltage. Only after the first movements it is possible for the actuator to calculate the slat angle and set them correctly.

Functionality of the ombra BA4-SMI series

Actuators of the type ombra BA4-SMI have four group objects. The objects are tied to the four SMI channels. The SMI units on the first SMI channel are controlled by the first group object, units on the second channel are controlled by the second group object and so on.

A group object controls the connected SMI motors via broadcast. During SMI read commands only one motor can be read. This motor is acting as representative for all motors of this particular group.

SMI Motors are periodically supervised and checked as a group for errors. If there are any motors disconnected, reconnected or newly connected then this also can be detected during the periodical checks and the affected motors are automatically (re-) configured for use. Configuration may take about 3 seconds per channel.

A single missing SMI motors can not be detected, because the actor has no knowledge about how many motors should have been connected to it in the first place. Only the disappearance of all connected motors can be detected.

Functionality of the ombra BA8/BA16-SMI series

Actors of the type ombra BA16-SMI can have up to 16 group objects. ombra BA8-SMI can have up to 8 group objects. Group membership can freely be configured and is independent of the SMI channel the unit is connected to.

It is possible for instance to configure a group object in such a way, that it has two SMI motors connected to the first channel and two others on channels 2 and 3 respectively. Other SMI motors on the same channels may be governed by other group objects.

Upon reconnecting motors to other SMI channels a new search phase is needed once but no change of the configuration is necessary. Triggering a search phase can be done through the LNS plug-in.

Each SMI motor possesses a unique slave/manufacture ID which is used to recognize individual motors. If, for instance, a motor of a group with slave ID 987654, manufacturer 3 is reconnected from channel 2 to channel 1 then there is no change in the configuration needed. The motor still belongs to the same group object. An additional triggered search phase is still needed though.

A group object controls all assigned SMI motors per channel in parallel using the multiple addressing GR_KEY mask addressing scheme. During SMI read commands only one motor can be read. This motor is acting as representative for all motors of this particular group.

SMI Motors are periodically supervised and checked individually and as a group for errors. Every single missing motor can be detected by the periodical checks.

Manual control

It is possible to control the connected SMI motors manually via the manual control rotary switches. The way how the switches control the SMI motors can be configured.

However, the configuration is only active after the spega controller itself has been commissioned, and configured. If the spega controller is not configured then a default configuration is used. During a search phase, manual control is not available.

spega controller not configured

The first rotary switch controls all motors on the first channel, the second rotary switch controls the second channel and so on. SMI Broadcast commands are used.

spega controller configured

It can be configured which rotary switch controls which group object. The range of possible assignments are defined by the plug-in software. The position of configured switches is indicated by LEDs.



When the rotary switch is not in position “**bus**”, it is not possible to control the objects assigned to this switch via LON commands!

LED rotary switch positions indications

<i>position</i>	<i>LED</i>	<i>description</i>
bus	off	bus, stop command
↓	red	move down command
↑	green	move up command

Positions of the rotary switches that are not assigned to an object are not shown by LEDs.

Indicators

LED indicator	Description
search phase during SMI commissioning	
red	Indicates the SMI channel that is being searched for SMI motors.
green	At least one SMI motor was found on this SMI channel
normal mode	
red	Manual command (by rotary switch) to move down. The LEDs are displaying the position of the rotary switches.
green	Manual command (by rotary switch) to move up. The LEDs are displaying the position of the rotary switches.
orange (=red+green) flashes	Signals SMI commands being send and received for this channel.
errors	
fast (5Hz) flashing of red LEDs	The associated SMI channel is short circuited.
fast (5Hz) flashing of all red LEDs	All SMI channels are short circuited or actuator has no 230VAC power supply.
fatal errors	
slow (0.5Hz) flashing of all red LEDs	Fatal error. Actuator is in error mode.

2.13.5 Commissioning

After the installation and connection of all components, the system is ready for use and must be configured.

LON

The service button at the front of the spega e.control controller can be used for commissioning the device. By pressing it shortly the unit sends its Neuron-ID. Additionally there is a label with the Neuron-ID attached to the device (as text and also as bar code), which can be used to do commissioning remotely.

Download the correct LON application to the spega e.control controller. One can recognize the successful completion of the download, when the red service LED switches it self off.

Afterwards the system must be configured with LNS plug-ins. There are also some mechanical parameters that must be configured/determined when using blinds with slat angle control.

SMI

A correctly configured ombra BA16-SMI actuator has to search at least once for all connected SMI devices and assign to all found SMI devices a unique 4bit SMI address. During this search all SMI motors, that will be used by the actuator, must be connected and have a working power supply.

This process (called search phase) can last up to 2 minutes depending on the number of connected devices. The search phase is triggered manually by a LNS plug-in.



If there have been SMI motors disconnected from, added to or reconnected to the ombra BA16-SMI actuator then the search phase must be repeated!

ombra BA4-SMI type devices use an shortened, automatic search phase (3 seconds per SMI channel) to select and configure a single motor as group reference.

Devices with manual control option can display with red LEDs during the search phase which channel is being searched. Green LEDs signal that at least one SMI motor has been found on this SMI channel. If both LEDs are switched on it will show as the combination color orange.

If there are more then 16 SMI motors found, then this is treated as fatal error, which is signaled on devices which manual control option by a slow (0.5Hz) flashing of all red LEDs.

Short circuited or overloaded SMI channels and missing 230VAC actuator supply voltage is signaled by fast flashing (5Hz) red LEDs.

2.14. clima AA4-10V



The clima AA4-10V analog I/O module is designed for connection to spega M/R series LON controller.

It offers two operating modes for each of its four channels.

For configuration, a comfortable LNS plug-in is available for the controller.

Analog output mode:

Each analogue I/O port can be separately configured as an output.

Through this up to four ports offer a constant output signal for actuators and similar devices with a 0-10V signal input.

The outputs have a continuous load capability of up to 20mA.

In this mode, the actuator-channel can be operated in conjunction with other e.control actuators for heating, ventilation and air-conditioning technology.

Analog input mode:

Each I/O port can be separately configured as an input for current or voltage measurement.

The type of input signal can be selected for each input channel separately via software:

0-10V, 2-10V, 0-20mA¹, 4-20mA¹

The analog input-channel can be operated in conjunction with other e.control actuators.

2.14.1 Technical data clima AA4-10V

Power supply

Operating voltage
Current consumption (full load)
Power dissipation (max.)

via spega M/R series LON controller
typ. 140mA (3,4W)
3,4W

Inputs/Outputs

Actuator interface

Control interface for spega modules

Analog inputs

max. 4 analog inputs 0-10V, 2-10V; > 50kΩ input resistance
max. 4 analog inputs 0-20mA, 4-20mA with external 500Ω burden

Analog outputs

max. 4 analog outputs 0-10V, 2-10V; min. load resistance 500Ω
max. 4 analog outputs 0-20mA, 4-20mA; max. load resistance 500Ω

Connections

Actuator Interface

integrated 14 pin connector

¹ via external resistor (500Ω)

Analog inputs/outputs	10 x 1pin terminal screw connection, Ø up to 4mm ²
Housing	
Protection	IP 20 (EN 60529)
Dimensions	85(45) x 52,5 x 60 mm (H x W x D) – corresponds to 3 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail
Ambient conditions	
Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level
Safety	
Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)
Standards	
Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.14.2 Mounting clima AA4-10V

1. Installation on DIN EN50022 rail, width 3 TE
2. During installation of cables please observe possible minimum distances to other cables in order to maintain a safe isolation.
3. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Circuits must obey SELV (Safety Extra Low Voltage) specifications.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.



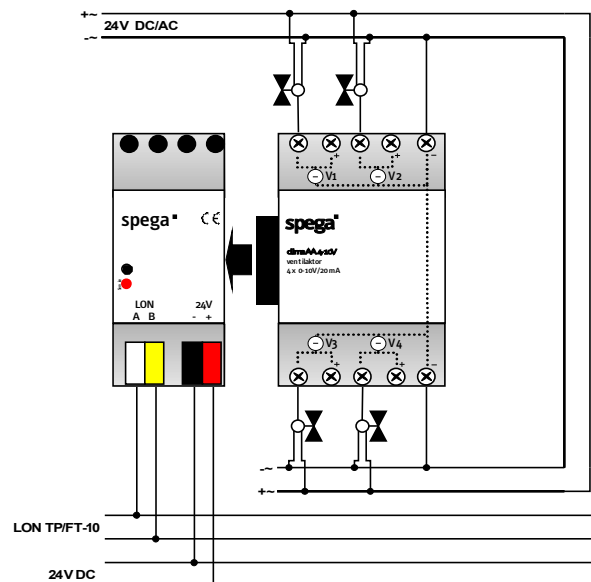
The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



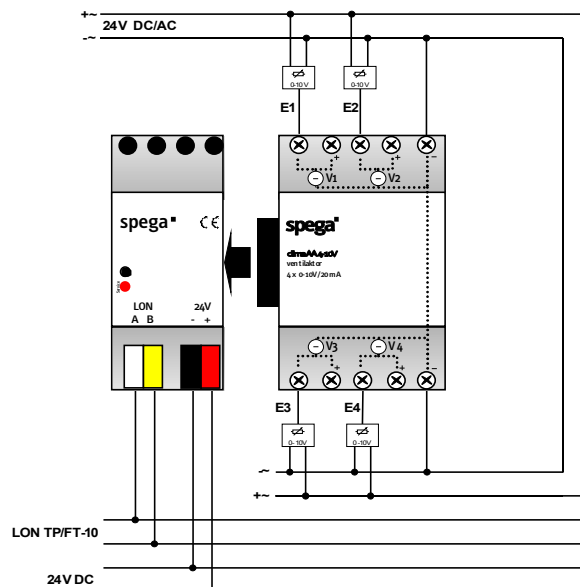
Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.14.3 Connecting clima AA4-10V

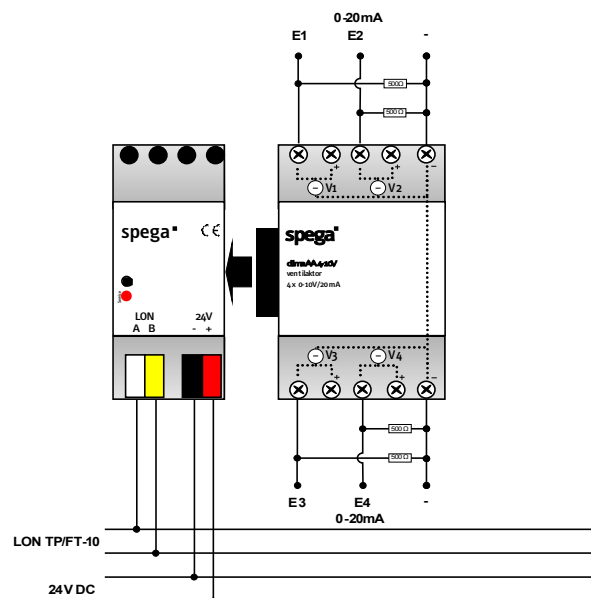
clima AA4-10V as output:



clima AA4-10V as input 0-10V:



clima AA4-10V as input 0-20mA:



2.15. clima AA8-10V



The clima AA8-10V analog I/O module is designed for connection to spega M/R series LON controller.

It offers two operating modes for each of its eight channels.

For configuration, a comfortable LNS plug-in is available for the controller.

Analog output mode:

Each analogue I/O port can be separately configured as an output.

Through this up to eight ports offer a constant output signal for actuators and similar devices with a 0-10V signal input.

The outputs have a continuous load capability of up to 20mA.

In this mode, the actuator-channel can be operated in conjunction with other e.control actuators for heating, ventilation and air-conditioning technology.

Analog input mode:

Each I/O port can be separately configured as an input for current or voltage measurement.

The type of input signal can be selected for each input channel separately via software:

0-10V, 2-10V, 0-20mA², 4-20mA²

The analog input-channel can be operated in conjunction with other e.control actuators.

2.15.1 Technical data clima AA8-10V

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	typ. 240mA (5,8W)
Power dissipation (max.)	5,8W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Analog inputs	max. 8 analog inputs 0-10V, 2-10V; > 50kΩ input resistance max. 8 analog inputs 0-20mA, 4-20mA with external 500Ω burden

² via external resistor (500Ω)

Analog outputs	max. 8 analog outputs 0-10V, 2-10V; min. load resistance 500Ω max. 8 analog outputs 0-20mA, 4-20mA; max. load resistance 500Ω
Connections	
Actuator Interface	integrated 14 pin connector
Analog inputs/outputs	12 x 1pin terminal screw connection, Ø up to 4mm ²
Housing	
Protection	IP 20 (EN 60529)
Dimensions	85(45) x 70 x 60 mm (H x W x D) – corresponds to 4 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail
Ambient conditions	
Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level
Safety	
Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)
Standards	
Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.15.2 Mounting clima AA8-10V

1. Installation on DIN EN50022 rail, width 4 TE
2. During installation of cables please observe possible minimum distances to other cables in order to maintain a safe isolation.
3. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Circuits must obey SELV (Safety Extra Low Voltage) specifications.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.



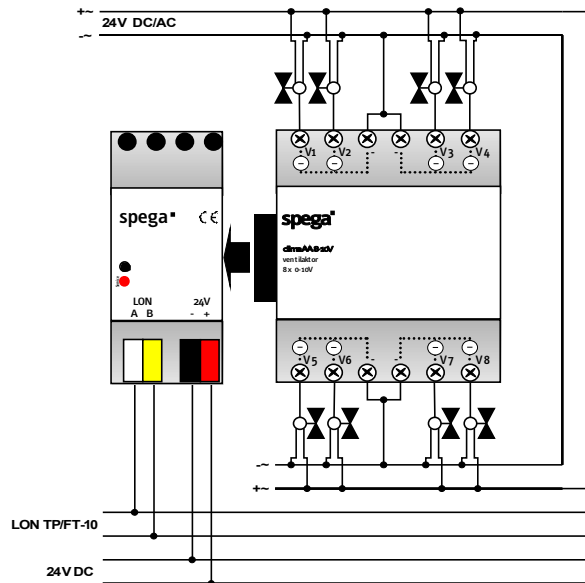
The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



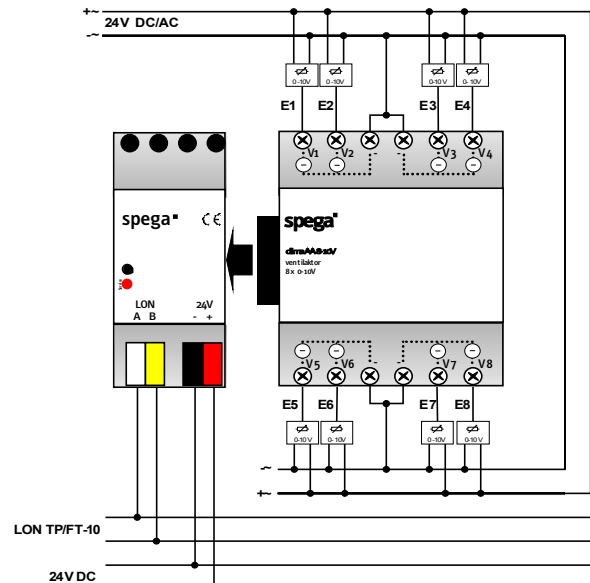
Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.15.3 Connecting clima AA8-10V

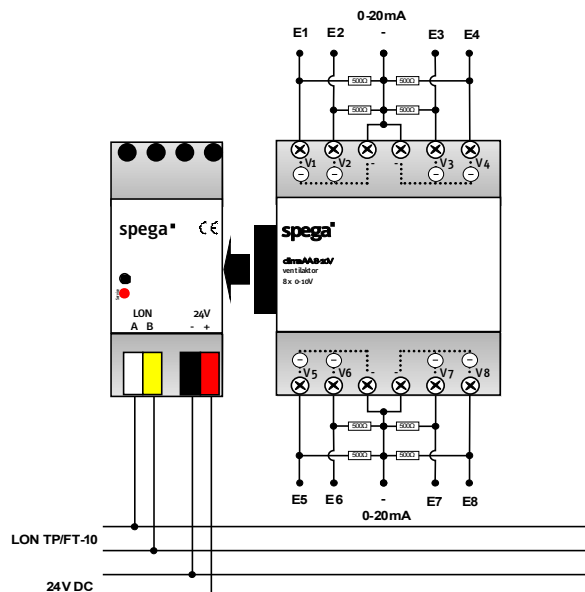
clima AA8-10V as output:



clima AA8-10V as input 0-10V:



clima AA8-10V as input 0-20mA:



2.16. clima AA4



The clima AA4 damper actuator is designed for connection to spega M/R series LON controller.

It offers 4 outputs for 4 thermoelectric drives or 2 motor drives with an operating voltage of 24V AC or 230V.

The TRIAC outputs have a continuous load capability of up to 750mA and 2 separate supply cables for different voltage sources or phase conductors.

The damper actuator can be operated in conjunction with other e.control actuators for heating, ventilation and air-conditioning technology together on one controller.

For configuration purposes, a comfortable LNS plug-in is available for the controller.

2.16.1 Technical data clima AA4

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	40 mA (1W)
Power dissipation (max.)	3 W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Actuator outputs	4 TRIAC outputs 24-230VAC, max. 750mA, (external power supply)

Connections

Actuator Interface	integrated 14 pin connector
Actuator outputs	10 x 1pin terminal screw connection, Ø up to 4mm ²

Housing

Protection	IP 20 (EN 60529)
Dimensions	85(45) x 52,5 x 60 mm (H x W x D) – corresponds to 3 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail

Ambient conditions

Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level

Safety

Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)

Standards

Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.16.2 Mounting clima AA4

1. Installation on DIN EN50022 rail, width 3 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

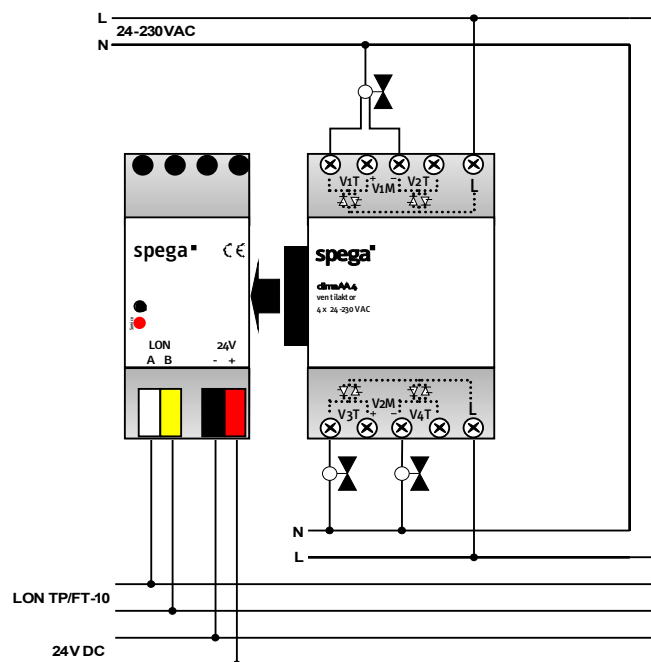


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.16.3 Connecting clima AA4



2.17. clima AA8



The clima AA8 is designed for connection to spega M/R series LON controller.

It offers 8 outputs for 8 thermoelectric drives or 4 motor drives with an operating voltage of 24V AC or 230V.

The Triac outputs have a continuous load capability of up to 500mA and 4 separate supply cables for different sources voltage or phase conductors.

The damper actuator can be operated in conjunction with other e.control actuators for heating, ventilation and air-conditioning technology together on one controller.

For configuration purposes, an comfortable LNS plug-in is available for the controller.

2.17.1 Technical data clima AA8

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	70 mA (1,7W)
Power dissipation (max.)	5,7 W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Actuator outputs	8 TRIAC outputs 24-230VAC, max. 500mA, (external power supply)

Connections

Actuator Interface	integrated 14 pin connector
Actuator outputs	12 x 1pin terminal screw connection, Ø up to 4mm ²

Housing

Protection	IP 20 (EN 60529)
Dimensions	85(45) x 70 x 60 mm (H x W x D) – corresponds to 4 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail

Ambient conditions

Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level

Safety

Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)

Standards

Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.17.2 Mounting clima AA8

1. Installation on DIN EN50022 rail, width 4 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

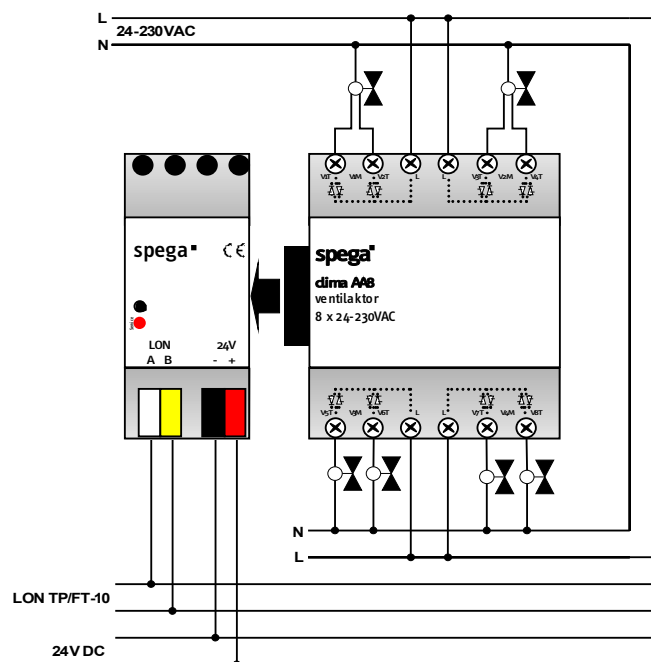


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.17.3 Connecting clima AA8



2.18. clima LA2-3



The clima LA2-3 multi-stage switching actuator serves to activate fan motors or similar devices which can be operated in several switching stages.

The actuator can operate either 2 devices with up to 3 stages each. The number of switching stages can be selected via the software used. The switching capacity of the outputs is 250W per Motor output. The motor stage outputs are mutually interlocked.

The multi-stage switching actuator can be operated in conjunction with other e.control actuators for heating, ventilation and air-conditioning technology.

For configuration purposes, an easy to use LNS plug-in is available for the controller.

2.18.1 Technical data clima LA2-3

Power supply

Operating voltage	via spega M/R series LON controller
Current consumption (full load)	40 mA (1W)
Power dissipation (max.)	1 W

Inputs/Outputs

Actuator interface	Control interface for spega modules
Switching outputs	2 X 3 relay outputs , interlocking contacts, nominal voltage max. 250V, switching capacity 250W (AC-3 load)
Output load vs. number of operation cycles	250 W at > 2 * 10 ⁵ operations 130 W at > 5 * 10 ⁵ operations 80 W at > 10 * 10 ⁵ operations

Connections

Actuator Interface	Integrated 14 pin connector
Switching outputs	8 x 1pin terminal screw connection, Ø up to 4mm ²

Control elements

clima LA2-3	-
clima LA2-3-b:	3-stage rotary switch for each channel. Functions: „off“, „bus“, „on“ (stage of „on“ position can be configured, default is „stage I“)

Indicators

clima LA2-3	-
clima LA2-3-b:	status LED: „stage I“, „stage II“ and „stage III“

Housing

Protection	IP 20 (EN 60529)
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Dimensions	85(45) x 52,5 x 60 mm (H x W x D) – corresponds to 3 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail
Ambient conditions	
Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level
Safety	
Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)
Standards	
Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.18.2 Mounting clima LA2-3

1. Installation on DIN EN50022 rail, width 3 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.



Switching inductive loads (for example contactors or electric motors) can produce powerful high frequency interferences, which may affect the functionality of this or other units. It is therefore recommended to install snubber circuits (e.g. RC snubber) on the outputs. Please refer to the manufactures of the connected loads for more information.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

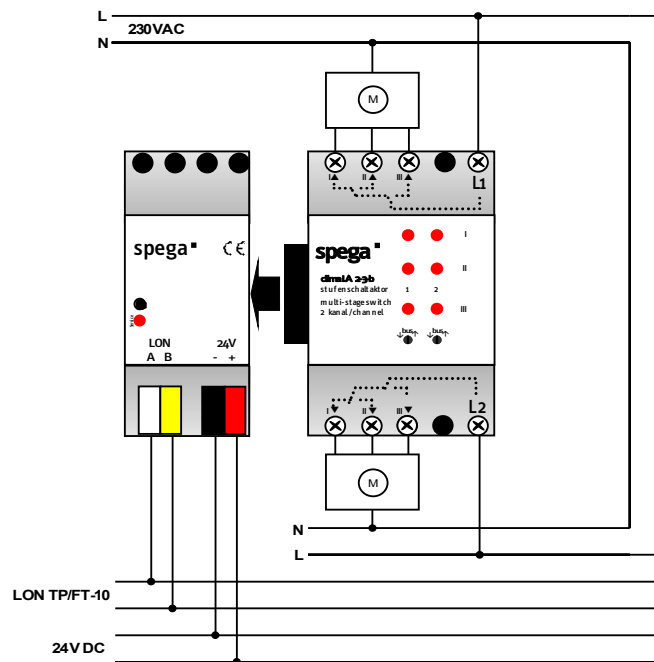


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.18.3 Connecting clima LA2-3



2.18.4 Operation and Indicators clima LA2-3

clima LA2-3

no control and indicator elements.

clima LA2-3-b:

Each channel can be switched on or off manually using a rotary switch installed on the front.

- | | |
|-------------------------|---|
| left position: | Channel is switched off. Bus control is switched off. |
| right position: | Channel is switched on. Stage can be configured. Bus control is switched off. |
| middle position: | Bus control is switched on. |

The logical channel state is displayed by a LED.



The logical channel state may not be the same as the physical state of the output relay!

2.19. clima AA8-MP



The MP-Bus actuator clima MP is designed for connection to spega M/R series LON controller.

The actuator can control up to eight MP-Bus compatible damper actuators, valve actuators or VAV actuators. The clima MP is the bus master on the Multi-Point-bus system with up to eight slaves.

A RJ12 socket on the front of the clima MP can be used to connect directly an external configuration- or diagnostic-tool (e.g. Belimo PC-Tool) – without disconnecting the bus wires.

The actuator can be operated in conjunction with other e.control actuators for heating, ventilation and air-conditioning technology.

For configuration purposes, an easy to use LNS plug-in is available for the controller.

2.19.1 Technical data clima AA8-MP

Power supply

Operating voltage DC	via spega M/R series LON controller
Current consumption DC	45 mA (1,1W)
Operating voltage MP-Bus Interface DC	24V DC, (21,6V - 28,8V)
Operating voltage MP-Bus Interface AC	24V AC, (19,2V - 28,8V)
Current consumption MP-Bus Interface	40mA (1W) with DC supply 100mA (2,4VA) with AC supply
Power dissipation (max.)	2,1W with DC supply 3,5W with AC supply

Inputs/Outputs

Actuator interface	Control interface for spega modules
Power supply MP-Bus Interface	present
EN (Tool-Enable)	control signal for switching off the MP-Bus Interface (U>9V, max. 18V)
MP-Bus interface	3-pin (0, 24V, MP)

Connections

Actuator Interface	Integrated 14 pin connector
Power supply, MP-Bus, EN (Tool-Enable)	6 x 1pin terminal screw connection, Ø up to 4mm ² Supply loop through for MP-Bus devices up to 100VA power consumption (dimensioning) possible Connection for Belimo ZIP-USB-MP or ZIP-RS232
RJ12 socket	

Indicators

Status-LED	Multi color LED showing MP-Bus actuator state
------------	---

Housing

Protection	IP 20 (EN 60529)
Dimensions	85(45) x 52,5 x 60 mm (H x W x D) – corresponds to 3 modular spacings
Type/location of installation	distribution board, 35mm DIN mounting rail

Ambient conditions

Operating temperature	-5°C ... +45°C
Storage temperature	-25°C ... +55°C
Transport temperature	-25°C ... +70°C
Relative humidity	5% ... 93% (w/o condensation)
Installation height	up to 2000 m above sea level

Safety

Electrical isolation	SELV (EN 60950)
Protection class	II (DIN EN 61140, VDE 0140-1)

Standards

Device safety	EN 50090-2-2
Immunity	EN 50090-2-2
Certification	CE

2.19.2 Mounting clima AA8-MP

1. Installation on DIN EN50022 rail, width 3 TE
2. The connection interface is located on the left-hand side of the housing. The actuator must only be operated with spega e.control controllers. Observe the maximum space available on the DIN rail.
3. MP-Bus Slaves must be configured with the Belimo tools.



Circuits must obey SELV (Safety Extra Low Voltage) specifications.



The power supply of the MP-Bus must not be connected to the DC power supply of the spega M/R series LON controller.



Electrical devices must be assembled and installed by trained personnel only.



Please observe local standards, guidelines and regulations when planning and installing electrical devices.



Do not exceed device specifications.

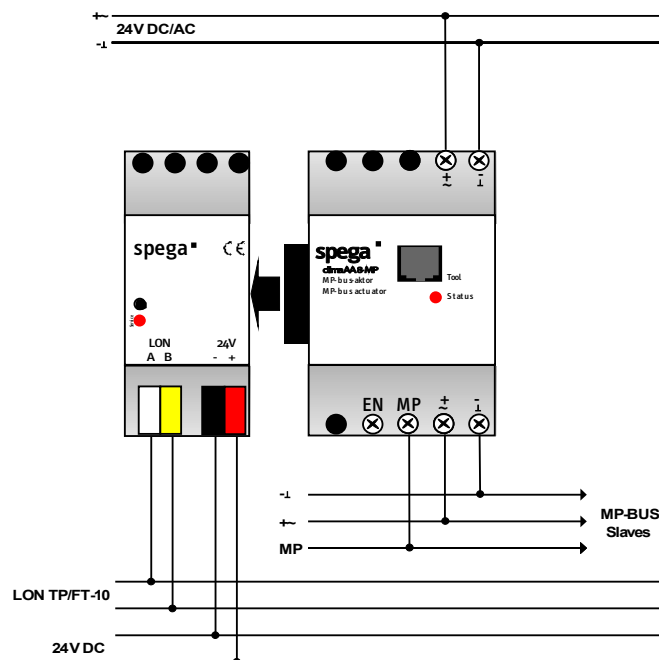


The system installer has to take care that the correct application and the associated parameters are corresponding with the wiring and the intended use of the device.



Connecting or disconnecting modules or controllers is only allowed if they are disconnected from all power supplies.

2.19.3 Connecting clima AA8-MP

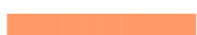


The EN terminal carries the same signal that is used on the RJ12 tool socket to deactivate the actuator during configuration tool usage.



There are no limits on bus topologies. Star-, ring-, tree topologies or combinations of those are allowed. No special cables or terminating resistors are needed. A MP bus connection can be established using normal installation cables. To accommodate an easy installation special bus cables can be obtained. For the maximum bus length please consult the appropriate documents from Belimo (www.belimo.com)

2.19.4 Operation and Indicators clima AA8-MP

Status LED		Meaning
OFF		24VDC power supply to controller missing
red, fast flashing		No MP bus power supply on +~ terminal.
red, slow flashing		MP line is short circuited.
orange, slow flashing		TOOL or EN is active, MP bus actuator is not initialized or there aren't any MP bus slaves configured.
orange, steady		TOOL is active, MP bus actuator is initialized and configured.
green, , slow flashing		OK, but MP bus actuator is not initialized or there aren't any MP bus slaves configured.
green, steady		OK, MP bus actuator is initialized and configured.

3. Applications

Using one of the M-series applications you can capture and control a wide selection of various sensors and actuators. The following M-series applications are available with e.control2:

Application	Objects	Specific features
SC121000MC2_41	24 universal objects 7 universal groups	Universal objects with 1 input NV each
SC121000EC2_61	16 universal objects 7 universal groups	Universal objects with 2 input NVs each

The software is divided into logical objects in accordance with LonMark™ Interoperability Guidelines.

3.1. Application data

You can select the desired application in the spega device template manager. All the required application files, resource files and plug-ins for the relevant project will be loaded.

Application	SC121000MC2_41	SC121000EC2_61
Software files	SC121000MC2_41.APB	SC121000EC2_61.APB
	SC121000MC2_41.NXE	SC121000EC2_61.NXE
	SC121000MC2_41.XIF	SC121000EC2_61.XIF
	SC121000MC2_41.XFB	SC121000EC2_61.XFB
Resource files	econtrol2 resource files required SC121000MC2_41/SC121000EC2_61: from version 1.04 onwards	
Plug-ins	sistema MC M-series device plug-in, object plug-ins, plug-ins for connected modules for controlling sub-buses (DALI, SMI, MP-bus)	



The software complies with LonMark™ Interoperability Guidelines. When using LNS-based integration tools we recommend the use of the resource files listed.

3.2. Hardware support

A series of modules is available for connecting the actuators and sensors. The module types listed are supported in the current revision shown for the applications quoted:

Module type	Application	Rev
clima AA4 clima AA8	Digital output module for thermoelectric or motorized actuators	2
clima AA4_10V clima AA8_10V	Analog input/output module with individually switchable channels for actuators or sensors	1
clima AA8_MP	MP-bus controller: Activates a maximum of 8 actuators and captures each sensor which can be connected to the actuator	1
clima AA4_MP	MP-bus controller: Activates a maximum of 4 actuators and captures each sensor which can be connected to the actuator	1
clima LA2_3	Multi-stage actuator with up to 3 stages	1
lumina BE8	Digital input for floating contacts (e.g. window contacts, dew point or occupancy sensors)	2

Module type	Application	Rev
lumina DAL4 lumina DAL8 lumina DAL16	DALI controller: Control and supply of a maximum of 64 DALI devices in groups of 4/8/16	2
lumina SA4 lumina SA8	Switch actuator 4 / 8 ports	2
lumina ST4	Control output for electronic ballasts with a 1-10V interface	2
ombra BA2 ombra BA4	Sunblind actuator with 2 mutually interlocked relays	2
ombra BA2_3E	Sunblind actuator with 3 mutually interlocked relays (for 3 end position blinds)	2
ombra BA4_DC	Sunblind actuator for DC motors with integrated pole reversing switch	2
ombra BA4_SMI ombra BA16_SMI	SMI controller: Control of a maximum of 16 SMI motors in groups of 4/16	2
ombra BA8_SMI	SMI controller: Control of a maximum of 16 SMI motors in groups of 8	2
ombra BA4_SMI LoVo ombra BA16_SMI LoVo	SMI controller: Control of a maximum of 16 SMI low voltage motors in groups of 4/16	2
ombra BA8_SMI LoVo	SMI controller: Control of a maximum of 16 SMI low voltage motors in groups of 8	2

Please always quote the revision number when placing orders. The revision number of a module can be found on the product sticker.

3.3. Automation functions

You can achieve a wide range of various automation functions with the M-series. Their availability depends on which modules are connected and how the objects are to be used.

3.3.1 VDI3813 – Functions

Sensorfunktionen

- Occupancy detection
- Window monitoring
- Dew point monitoring
- Air temperature measurement
- Brightness measurement
- Air quality measurement

Actuator functions

- Light actuator
- Sunblind actuator
- Damper/Valve actuator

Operating and display functions

- Space usage selection
- Occupancy setting

Application functions

- Light switch
- Stair lighting
- Priority evaluation
- Sequence control
- Output range control

3.3.2 Extended function

Administration

- Device management
- Status feedback based on LonMark
- Extended status feedback
- Device localization

Object behaviour

- Action in the event of communication faults
- Action following resumption of power supply or reset
- Switchable network variable types
- Transmission response for output network variables
- Valve rinsing
- Pulse width modulation for actuators
- Activation via groups
- Delayed telegram processing for groups

4. Setting-up and configuring a device

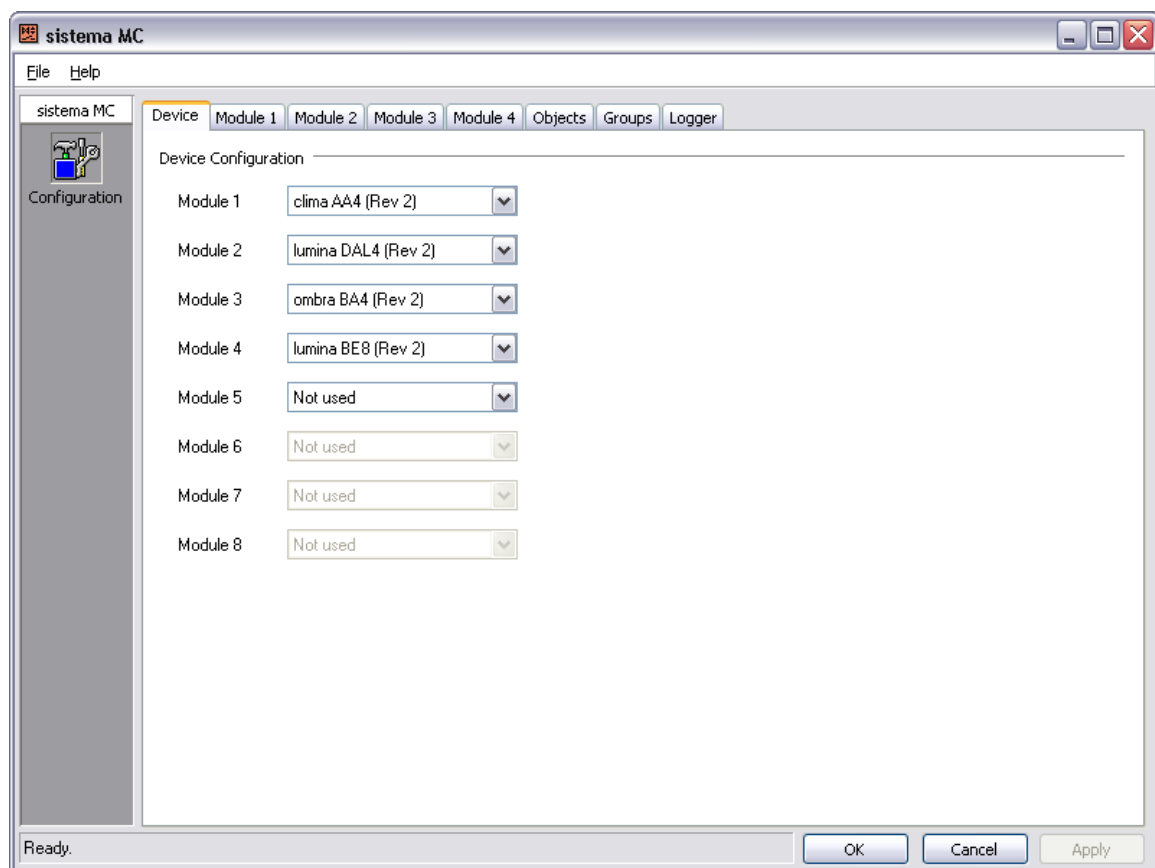
To use a sistema MC device for your project, you must first install the e.control plug-in setup program either from the CD or from the internet. The setup program contains the application files, LNS plug-ins, configuration software and manuals.

4.1. Setting up the device

First you must create a device template in your LNS project. For this you have the spega e.control Device Template Manager, which can be run as a plug-in on your project. The sistema MC device can be found in the "M-series - modular system" category. This features a selection of all available device templates. Select the desired template and accept it for your project. You can then set up the device in the usual way using the corresponding device template.

4.2. Configuring the device

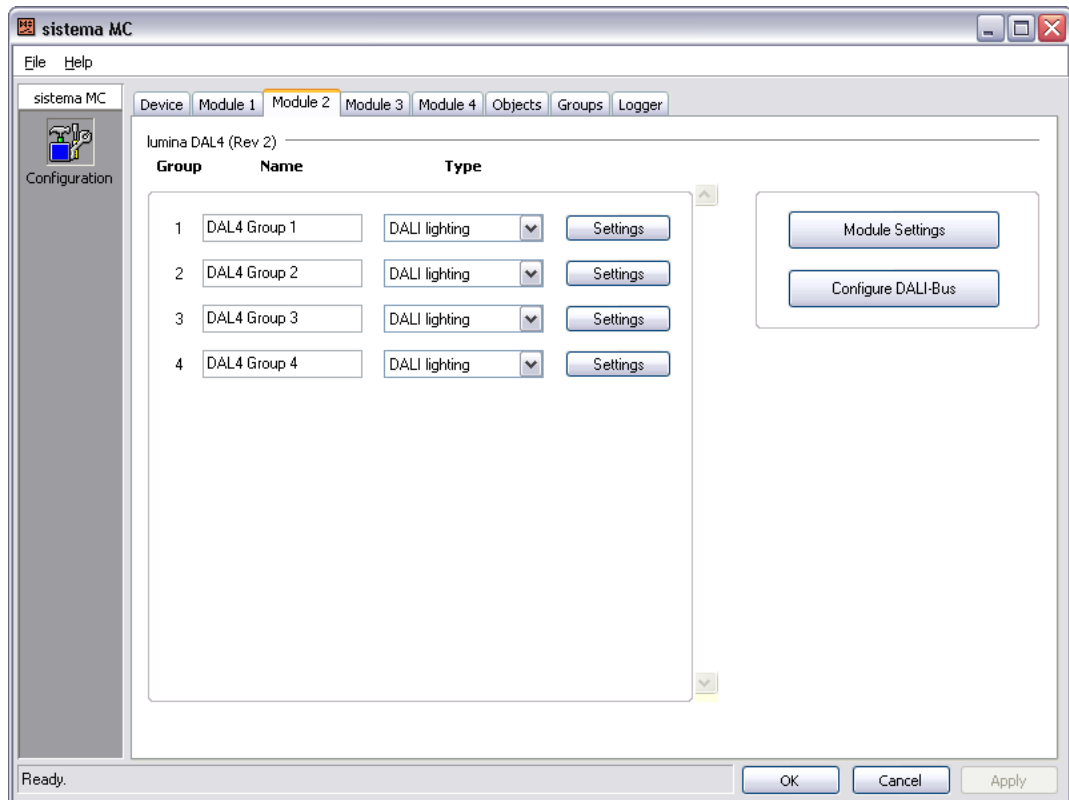
To configure a sistema MC you must first start the device plug-in. Start the configuration on the 1st "Device" tab and enter the connected modules in the order in which they are/should be connected to the sistema MC.



A tab, on which the corresponding module can be configured, will appear for each module selected in the device configuration.

4.2.1 Module configuration

You will find a list of all channels on the tab of a module. These can be named and configured. There are one or more channel types available, depending on the module. Clicking on the "Module settings" button opens a dialog box where module-specific parameters can be set. Some modules feature additional plug-ins for starting sub-bus systems.



A precise description of the configuration options is given in the following chapters.

4.2.2 Assigning the channels to objects

You must first determine the application of the individual objects by setting the relevant type on the "Objects" tab. Object types are not specified as standard. The object is not operational.

Object types	Application
Lighting actuator	Operation of switchable, dimmable lighting
Sunblind actuator	Moving of various sunblind systems and controllable windows
HVAC actuator	Control of actuators (valves, flaps, fans etc.)
Analog input	Detection of analog sensors
Binary input	Detection of binary contacts (e.g. window contacts, dew point sensors) and occupancy sensors

Configure Universal Objects

Note:

The red border denotes the channel being used by the respective object for acquiring the feedback message.

No.	Name	Type	
1	UniversalObject[0]	Not used	Plug-in
2	UniversalObject[1]	Not used	Plug-in
3	UniversalObject[2]	Lamp acuator	Plug-in
4	UniversalObject[3]	Sunblind actuator	Plug-in
5	UniversalObject[4]	HVAC actuator	Plug-in
6	UniversalObject[5]	Analog input	Plug-in
		Binary input	
		Not used	

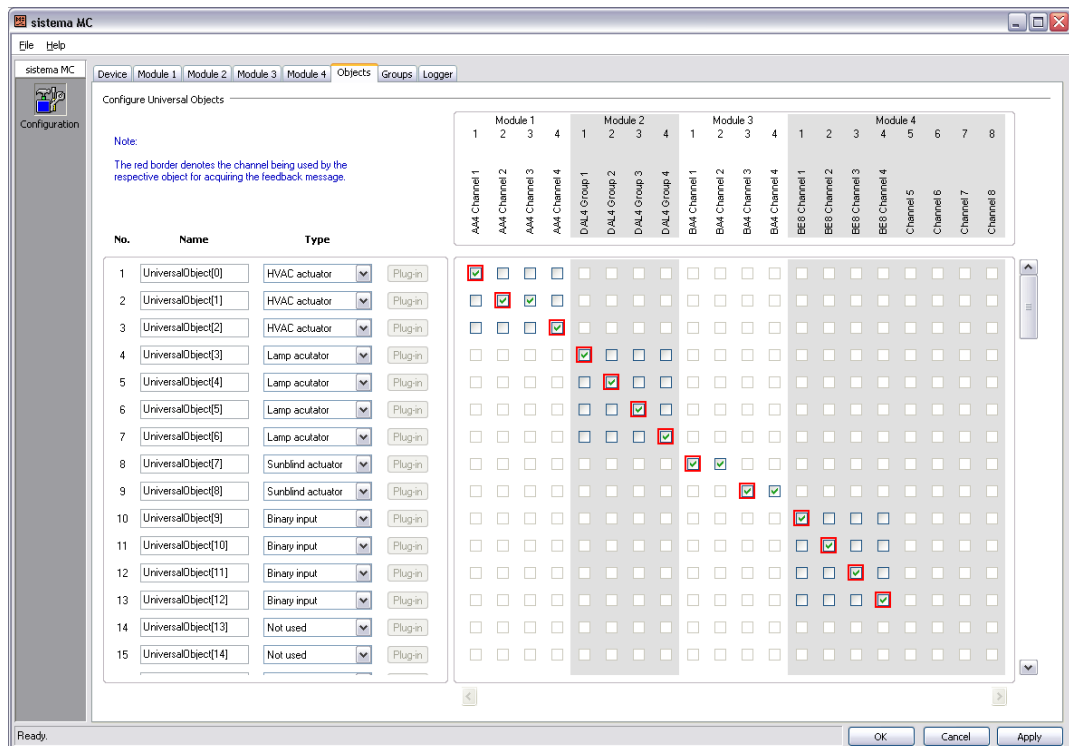
The table shows which channel types can be activated or captured by the individual object types.

Channel types	Object types				
	Lighting actuator	Sunblind actuator	HVAC actuator	Analog input	Binary input
Switched load	x				
Dimmed lighting	x				
DALI lighting	x				
Shade		x*			
Awning		x*			
Blind		x*			
Blind 3 end positions		x*			
Window		x*			
Valve (constant)			x		
Valve (6-way)			x		
Valve (2-point)			x		
Valve (3-point)			x		
Fan (on/off)			x		

Channel types	Object types				
	Lighting actuator	Sunblind actuator	HVAC actuator	Analog input	Binary input
Fan (2-stage)			x		
Fan (3-stage)			x		
Analog input				x	
Digital input					x

* no mixed channels are allowed on the same object

The channels are assigned to objects by checking the boxes in the assignment matrix.



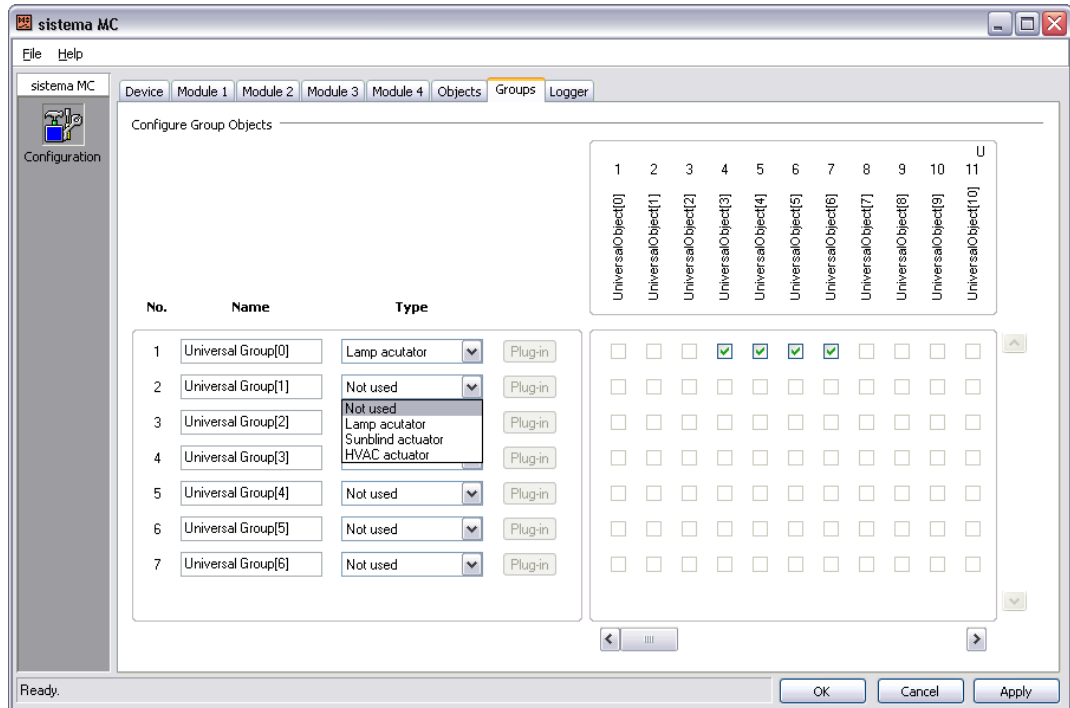
Once the changes made are accepted, the individual objects can be configured by clicking "Plug-in".

4.2.3 Configuring objects

Objects are configured via the object plug-ins, which can be run directly from the device plug-in on the "Objects" tab. Alternatively, the object plug-ins can also be started directly on the corresponding object in the LNS tool. A precise description of the setting options for the individual object types is given in the following chapters.

4.2.4 Creating and configuring groups

On the "Groups" tab you must first specify for which of the object types listed above the group is to be used. You can then stipulate the members of the group.



These can be run in the device plug-in on the "Groups" tab or in the LNS tool on the group objects. A precise description of the setting options for the individual group object types is given in the following chapters.

4.3. Module Configuration

The application supports control of several module types. The setting of connected modules has to be done in the device plug-in, as described in the relevant section. Functionality and parametrization vary depending on module type.

4.3.1 clima AAx

The clima AA4 and clima AA8 actuator modules feature outputs for thermoelectric or motor-driven drives.

The following documentation is valid for modules with:

Revision	2
Hardware version	001.000
Firmware version	001.017

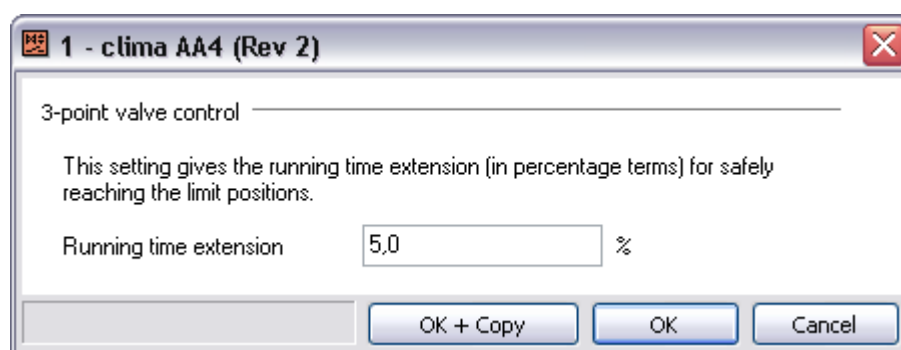
Modules

The modules listed are grouped under the module type clima AAx:

Module types	Number of channels
clima AA4 (Rev 2)	4
clima AA8 (Rev 2)	8

Module parametrization

The module is parameterized in the device plug-in on the tab of the corresponding module. The module parameters can be accessed via the "Module settings" button.



Channel parametrization

A type must first be selected for each channel. Further settings can be made depending on the channel type.

Channel types

With the clima AAx-type modules there are 3 types of channel to choose from:

clima AA4 (Rev 2)

Channel	Name	Type	
1	AA4 Channel 1	Not used	Settings
2	AA4 Channel 2	Not used	Settings
3	AA4 Channel 3	Valve (2-P.) Valve (3-P.) Switched load	Settings
4	AA4 Channel 4	Not used	Settings

With 3-point valves two channels must be used. They can only be set on "uneven" channels and also uses the next channel up.

Settings

The available settings for the channel depend on the type.

Valve (2-point)

This channel type is used for 2-point actuators and thermoelectric drives. For quasi-continuous control, pulse width modulation can be parameterized in the assigned HVAC object.

clima AA4 (Rev 2)/AA4 Channel 1

Mode of action

This setting determines the action of the valve drive.

Valve is normally Closed (NC)

Maintenance Closed (NC)
Opened (NO)

This setting determines the valve flush duration to protect against jamming when the valve is closed. Note: the servicing frequency is defined in the object.

Valve flush duration 300 s

OK + Copy OK Cancel

Valve (3-point)

This channel type must be selected when connecting 3-point actuators.

clima AA4 (Rev 2)/AA4 Channel 3

Mode of action

This setting determines the action of the triac outputs for controlling the drive.

Mode of action

Maintenance

This setting determines the valve flush duration to protect against jamming when the valve is closed. Note: the servicing frequency is defined in the object.

Valve flush duration s

Running time

This setting determines the running time between both limit positions of the valve.

Running time s

Calibration

These settings determine the positioning calibration following relative positioning movements.

Calibrate after movements

Reference position

Switched load

This type may be used where a simple switched load is connected.

clima AA4 (Rev 2)/AA4 Channel 2

Mode of action

This setting determines the action of the triac output.

On ON the triac is

Copying parameters

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Replacing a module

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

4.3.2 clima AAX-10V

The clima AA4-10V and clima AA8-10V actuator modules can be used either as analog outputs for continuous drives or as analog inputs for active sensors.

The following documentation is valid for modules with:

Revision	2
Hardware version	001.000
Firmware version	002.001

Modules

The modules listed are grouped under the module type clima AAX-10V:

Module types	Number of channels
clima AA4-10V (Rev 2)	4
clima AA8-10V (Rev 2)	8

Channel parametrization

A type must first be selected for each channel. Further settings can be made depending on the channel type.

Channel types

With the clima AAX-10V-type modules there are 4 types of channel to choose from:

clima AA4-10V (Rev 2)

Channel	Name	Type	
1	Channel 1	Valve (cont)	Settings
2	Channel 2	Not used	Settings
3	Channel 3	Valve (cont)	Settings
		Valve (6-way)	
		Analog output	
		Analog input	
4	Channel 4	Not used	Settings

Settings

The available settings for the channel depend on the type.

Valve (continuous)

This type of channel is used for continuous actuators with linear control.

clima AA4-10V (Rev 2)/Channel 1

Mode of action —

This setting determines the action of the valve drive.

On min signal valve is

Maintenance —

This setting determines the valve flush duration to protect against jamming when the valve is closed. Note: the servicing frequency is defined in the object.

Valve flush duration s

Operating range —

This setting determines the operating range of the connected valve drive.

Operating range

Valve (6-way)

This type of channel is used for continuous actuators for controlling 6-way valves. Control is performed continuously within the configurable sequence limits. Within the assigned HVAC object both sequences are distinguished by the algebraic sign of the control value.

clima AA4-10V (Rev 2)/Channel 1

Mode of action _____

With these settings the characteristic curve of the heating and cooling sequence of the 6-way valve is shown as a function of the ball valve position.

Order of sequences S1: Cooling / S2: Heating ▼
S1: Cooling / S2: Heating
S1: Heating / S2: Cooling

k_v ↑
max

α / α_{max}

0,0 % 33,0 % 67,0 % 100,0 %

Maintenance _____

This setting determines the valve flush duration to protect against jamming when the valve is closed. Note: the servicing frequency is defined in the object.

Valve flush duration 300 s

Operating range _____

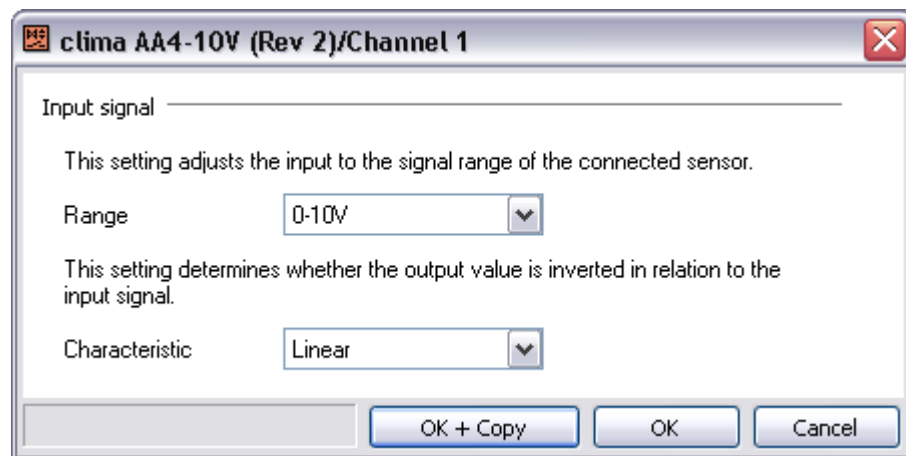
This setting determines the operating range of the connected valve drive.

Operating range 0-10V ▼

OK + Copy OK Cancel

Analog input

This channel type is used if analog sensors are connected.

***Copying parameters***

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Replacing a module

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

4.3.3 clima AAx-MP

The clima AA8-MP and clima AA4-MP actuator modules can activate MP bus devices and also pick up a directly connected sensor for each MP bus device.

The following documentation is valid for modules with:

Revision	1
Hardware version	001.000
Firmware version	002.000 or higher

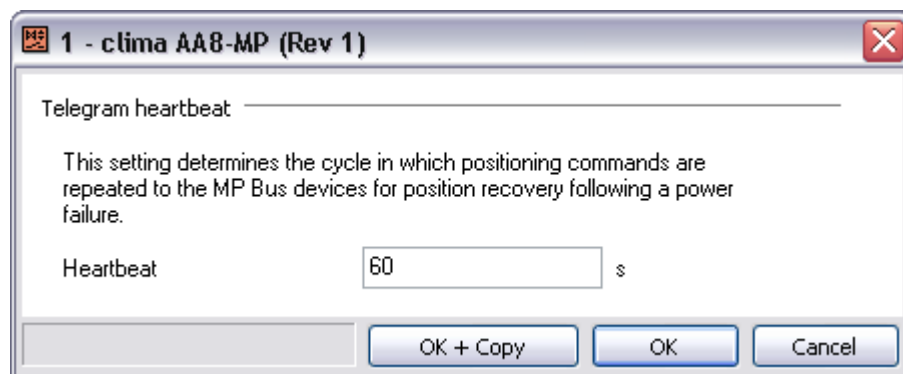
Module

The modules listed are grouped under the module type clima AAx-MP:

Module type	Number of MP-Bus members
clima AA4-MP (Rev 1)	4
clima AA8-MP (Rev 1)	8

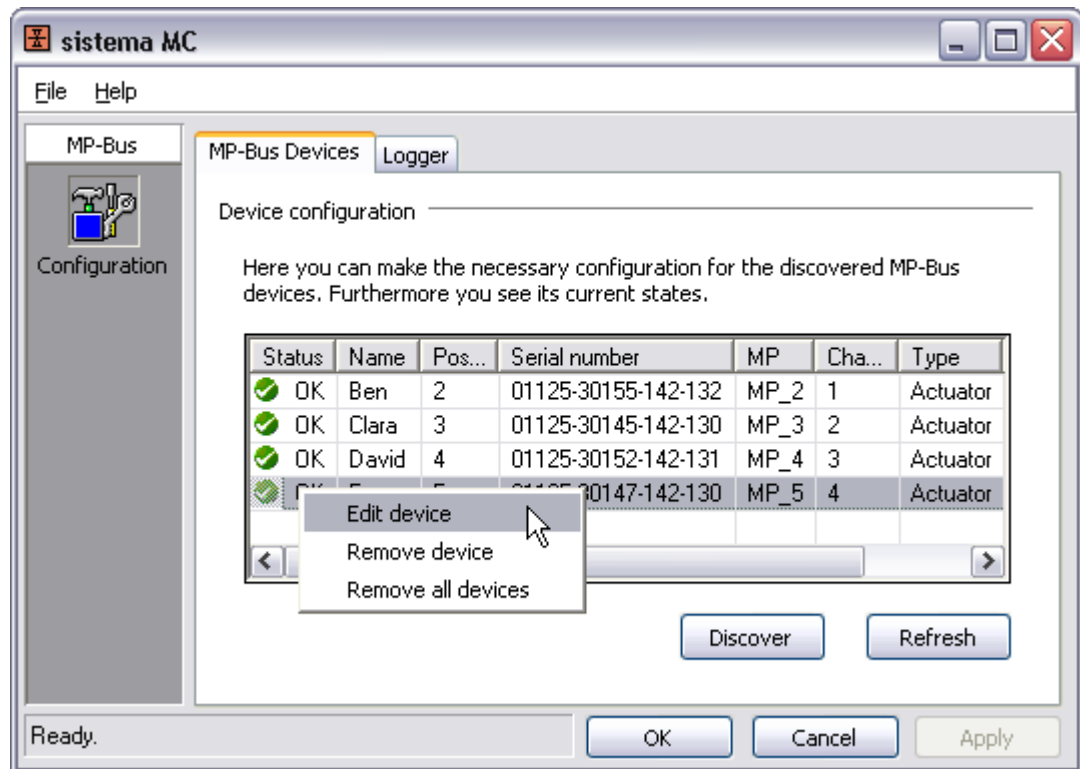
Module parametrization

The module is parameterized in the device plug-in on the tab of the corresponding module. The module parameters can be accessed via the "Module settings" button.



Configuring the MP-Bus

You can start the configuration of the MP bus in the device plug-in on the tab of the corresponding module by clicking "Configure MP-Bus".



General

A brand new clima AA8-MP or clima AA4-MP module does not feature any configuration as standard. This means the list of MP bus devices is empty. To ensure connected devices can be controlled, they need to be made known to the module.

Adding MP-Bus devices

The MP bus devices to be controlled must have an MP bus address and be connected to the module. To add the connected devices to the list, click the "Search" button. The devices found are added to the list with their unique serial number and programmed information including "Name", "Where installed" and MP bus address. The devices must now be assigned a channel each. Click in the "Channel" column of the relevant device and select the desired channel. Click "Accept" to save the configuration.

Connected sensors

To be able to read in a sensor which is directly connected to an MP bus device, the sensor must be configured for this purpose. To do this, open the context menu by right-clicking the relevant device and select "Edit device". A new dialog box will open and you may select the corresponding sensor type.

MP-Bus device status display

The symbols in front of the individual MP bus devices show whether communication with the device concerned is possible. The display can be updated by clicking "Update". Please note that devices, once added, must first be made known to the module - by clicking "Accept" - before their status can be retrieved.

Removing MP-Bus devices

To remove a device from the configuration, click on the "Channel" column of the device concerned and set the channel to "None". Click "Accept" to save the configuration.

Channel parametrization

A type must first be selected for each channel. Further settings can be made depending on the channel type.

Channel types

With the clima AAx-MP module you can choose between 2 types of actuator channel ...

clima AA8-MP (Rev 1)

Channel	Name	Type	
1 A	Aktor 1	Valve (cont) ▼	Settings
2 A	Aktor 2	Not used Valve (cont) Valve (6-way)	Settings
3 A	Aktor 3	Not used ▼	Settings
4 A	Aktor 4	Not used ▼	Settings

... and 2 types of sensor channel:

clima AA8-MP (Rev 1)

Channel	Name	Type	
6 A	Aktor 6	Not used ▼	Settings
7 A	Aktor 7	Not used ▼	Settings
8 A	Aktor 8	Not used ▼	Settings
1 S	Sensor 1	Not used ▼	Settings
2 S	Sensor 2	Not used Analog input Digital input	Settings
3 S	Sensor 3	Not used ▼	Settings

Settings

The available settings for the channel depend on the type.

Valve (continuous)

This type of channel is used for continuous actuators with linear control.

clima AA8-MP (Rev 1)/Aktor 1

Mode of action _____

This setting determines the action of the valve drive.

On min signal valve is Closed (NC)

Maintenance _____

This setting determines the valve flush duration to protect against jamming when the valve is closed. Note: the servicing frequency is defined in the object.

Valve flush duration 300 s

OK + Copy OK Cancel

Valve (6-way)

This type of channel is used for continuous actuators for controlling 6-way valves. Control is performed continuously within the configurable sequence limits. Within the assigned HVAC object both sequences are distinguished by the algebraic sign of the control value.

clima AA8-MP (Rev 1)/Aktor 1

Mode of action _____

With these settings the characteristic curve of the heating and cooling sequence of the 6-way valve is shown as a function of the ball valve position.

Order of sequences S1: Cooling / S2: Heating

k_v ↑

max

S 2

α / α_{max}

0,0 % 33,0 % 67,0 % 100,0 %

Maintenance _____

This setting determines the valve flush duration to protect against jamming when the valve is closed. Note: the servicing frequency is defined in the object.

Valve flush duration 300 s

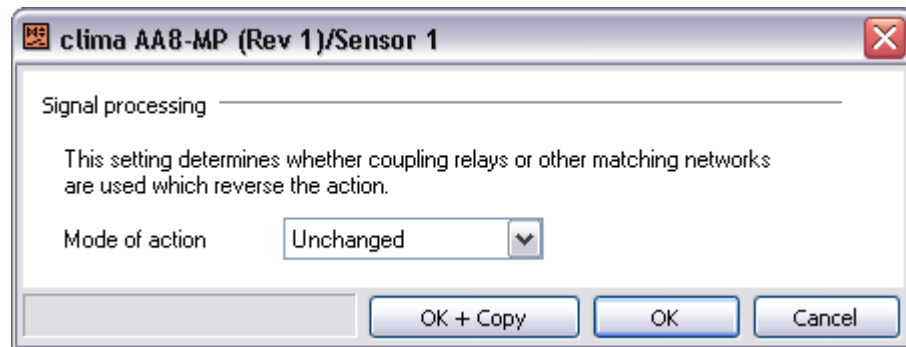
OK + Copy OK Cancel

Analog input

This channel type is used if analog sensors are connected. Detailed settings for the connected sensors have to be made in the MP-Bus plug-in.

Digital input

The digital input channel type is used for simple binary contacts.

***Copying parameters***

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Replacing a module

During the MP bus configuration, the module configuration is also saved in the LNS project database (e.control Plug-ins V2.10 or higher). This allows a comfortable module replacement.

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

You can now run the MP bus configuration from the device plug-in. A module replacement is automatically detected by the configuration software. The saved configuration is stored in the new module. Now the MP bus is again ready for operation.

Backup and restore of the module configuration per file is also available.

Replacing a bus node

If an MP bus device needs to be replaced, the device in question must first be removed from the list before a new device is added. For further details refer to the sections entitled "Removing MP bus devices" and "Adding MP bus devices" in Chapter "Configuring the MP-bus".

Extended status feedback

Configured clima AAx-MP modules can detect states of MP-bus devices. The device management supports an output of these states via network variable. Following states can be detected:

Status	Type of failure
MP bus device reporting peripheral error	peripheral failure on the sub-bus device
MP bus device reporting device failure	sub-bus device failure
communication failure with the MP bus device	sub-bus device communication error
No MP bus power supply	sub-bus device communication error

4.3.4 clima LA2-3

The clima LA2-3 multi-stage actuator features outputs for up to 3 switching stages.

The following documentation is valid for modules with:

Revision 1
Hardware version 001.000
Firmware version 001.017

Module

Module type	Number of channels
clima LA2-3 (Rev 1)	2

Module parametrization

The module is parameterized in the device plug-in on the tab of the corresponding module. The module parameters can be accessed via the "Module settings" button.

1 - clima LA2-3 (Rev 1)

Blind control

This setting gives the drive time extension (in percentage terms) for safely reaching the limit positions.

Drive time extension %

This setting gives the closing time of slats from the working position (2nd limit position) to the closing position (3rd limit position). It corresponds to several times the slat opening time (see channel setting).

Slat closing time factor

This setting determines which position of the 3-end-position blind is approached when using the manual control on the module.

Blind position

Fan control

This setting determines which stage is activated when using the manual control on the module.

Fan stage

Channel parametrization

A type must first be selected for each channel. Further settings can be made depending on the channel type.

Channel types

With the clima LA2-3-type modules there are 9 types of channel to choose from:

clima LA2-3 (Rev 1)

Channel	Name	Type	
1	Channel 1	Fan (on/off)	Settings
2	Channel 2	Fan (2-stage) Fan (3-stage) Shutter Awning Venetian blind Venetian blind 3 end Window Switched load	Settings

Settings

The available settings for the channel depend on the type.

Fan (on/off)

This channel type is used for fans which are only switched on or off.

clima LA2-3 (Rev 1)/Channel 1

Switching performance

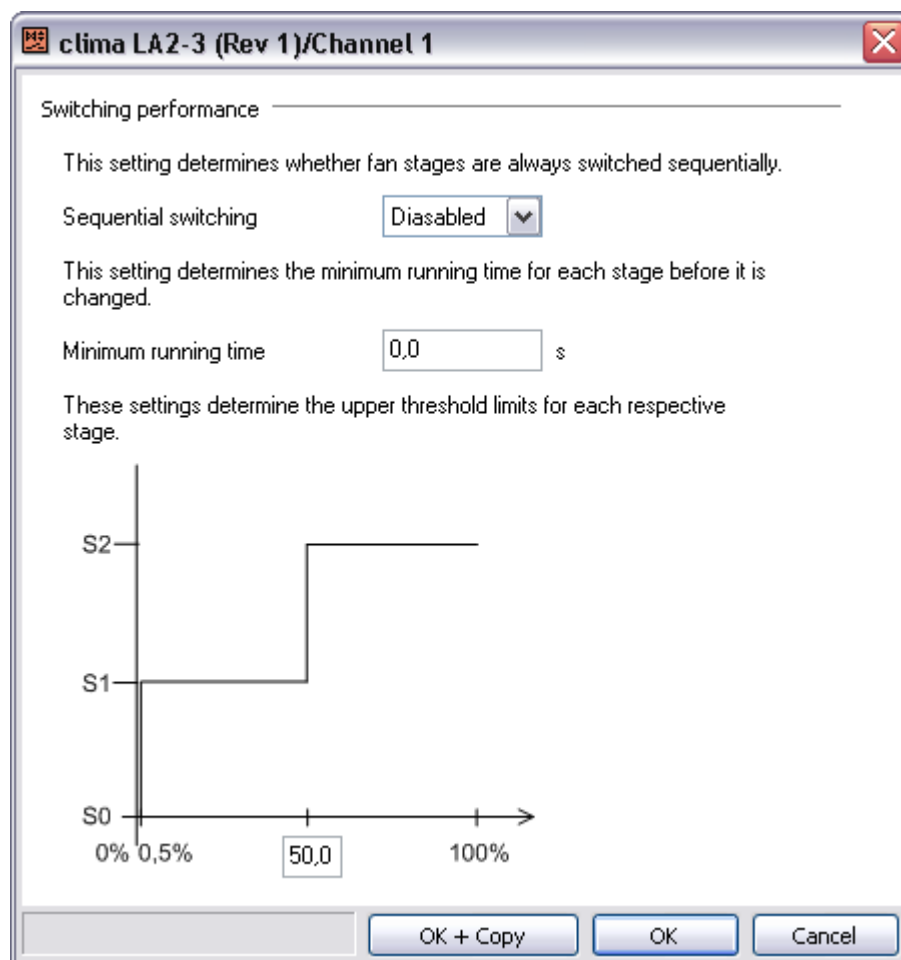
This setting determines the minimum running time for each stage before it is changed.

Minimum running time s

OK + Copy OK Cancel

Fan (2-stage)

This channel type is used for controlling fans with two switching stages.



Fan (3-stage)

This channel type is used for controlling fans with three switching stages.

clima LA2-3 (Rev 1)/Channel 1

Switching performance

This setting determines whether fan stages are always switched sequentially.

Sequential switching

This setting determines the minimum running time for each stage before it is changed.

Minimum running time s

These settings determine the upper threshold limits for each respective stage.

0% 0,5% 33,0 66,5 100%

OK + Copy OK Cancel

Shade

This channel type is offered for controlling shades.

clima LA2-3 (Rev 1)/Channel 1

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay s

Positioning

Drive time DOWN s

Drive time UP s

Shutter slot opening

This setting determines the time for raising the shutter once the lower limit position is reached, in order to ensure proper rear ventilation.

Travel time for opening s

Awning

This channel type is provided for controlling awnings.

clima LA2-3 (Rev 1)/Channel 1

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay s

Positioning

Drive time DOWN s

Drive time UP s

Tautening

This setting determines the time for retracting the awning each time it is extended, in order to ensure proper tautening.

Travel time for tautening s

Blind

This channel type is offered for controlling blinds.

clima LA2-3 (Rev 1)/Channel 1

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position Upper end position

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay 0,5 s

Positioning

☐ Wizard-based evaluation

last executed on

Start wizard

☒ Manual input

Drive time DOWN 60,0 s

Drive time UP 65,0 s

Mechanical slip 0,00 s

Slat turn time 2,00 s

Lower hysteresis 0,00 s

Upper hysteresis 0,00 s

OK + Copy OK Cancel

Blind, 3 end positions

This channel type should be used for sunblinds with 3 end positions.

clima LA2-3 (Rev 1)/Channel 1

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position Upper end position

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay 0,5 s

Positioning

☐ Wizard-based evaluation

last executed on

Start wizard

☒ Manual input

Drive time DOWN 60,0 s

Drive time UP 65,0 s

Mechanical slip 0,00 s

Slat turn time 2,00 s

Slat open time 3,0 s

Lower hysteresis 0,00 s

Upper hysteresis 0,00 s

OK + Copy OK Cancel

Window

Windows are controlled using this channel type.

clima LA2-3 (Rev 1)/Channel 1

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay s

Positioning

Drive time OPEN s

Drive time CLOSE s

Switched load

This type may be used where a simple switched load is connected.

clima LA2-3 (Rev 1)/Channel 1

Mode of action

This setting determines the action of the relay.

On ON the relay is

Copying parameters

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Replacing a module

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

4.3.5 lumina BE8

The lumina BE8 binary input module is used to capture floating contacts, such as window contacts and dew point or occupancy sensors.

The following documentation is valid for modules with:

Revision	2
Hardware version	001.001
Firmware version	002.002

Module

Module type	Number of channels
lumina BE8 (Rev 2)	8

Channel parametrization

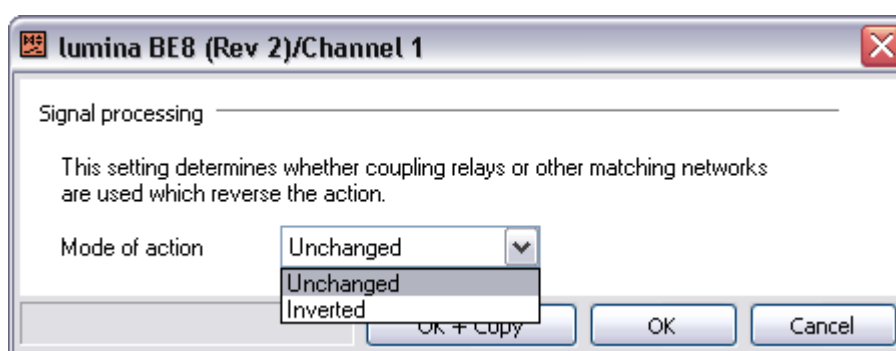
A type must first be selected for each channel. Further settings can be made depending on the channel type.

Channel types

Only the digital input can be selected as a channel type for the lumina BE8 module.

Settings

The digital input channel type is used for simple binary contacts.



Copying parameters

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Replacing a module

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

4.3.6 lumina DALx

The lumina DAL4, lumina DAL8 and lumina DAL16 lighting actuator modules are used to activate up to 64 DALI devices in groups.

The following documentation is valid for modules with:

Revision	2
Hardware version	001.000 or higher
Firmware version	002.003 or higher

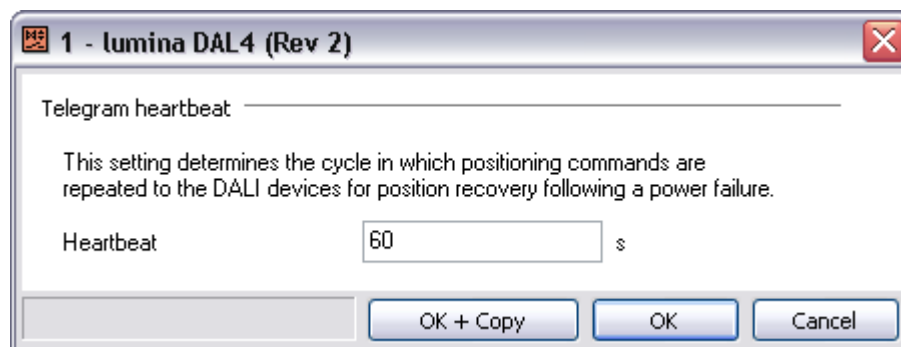
Modules

The modules listed are grouped under the module type lumina DALx:

Module types	Number of groups
lumina DAL4 (Rev 2)	4
lumina DAL8 (Rev 2)	8
lumina DAL16 (Rev 2)	16

Module parametrization

The module is parameterized in the device plug-in on the tab of the corresponding module. The module parameters can be accessed via the "Module settings" button.



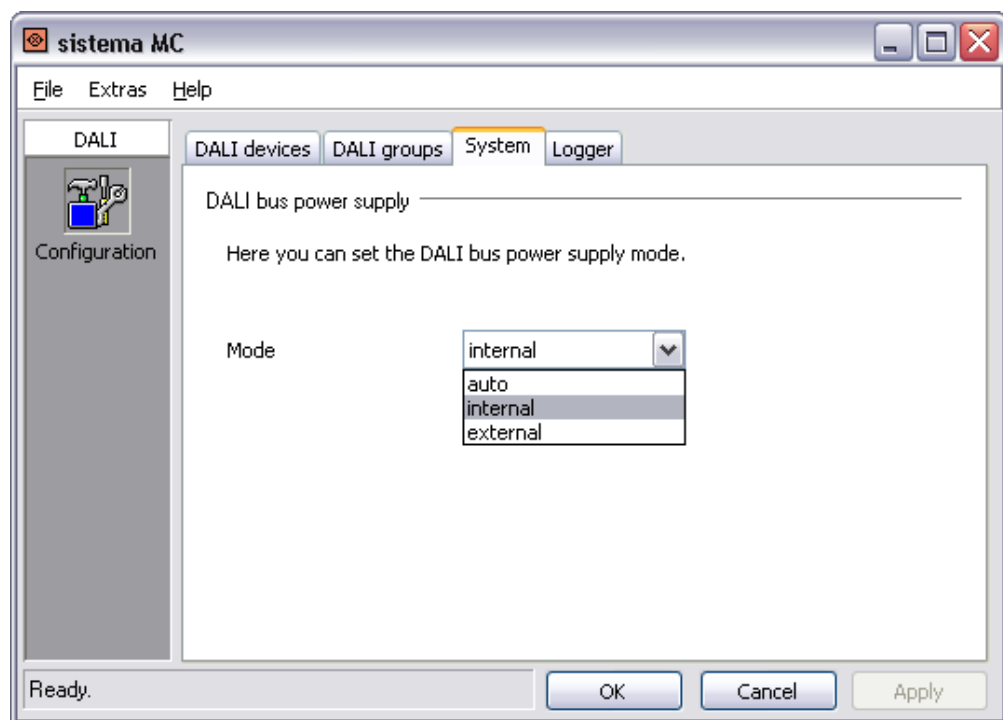
This setting is particularly important when using an emergency power system.

Configuring the DALI-Bus

You can start the configuration of the DALI bus in the device plug-in on the tab of the corresponding module by clicking "Configure DALI-Bus".

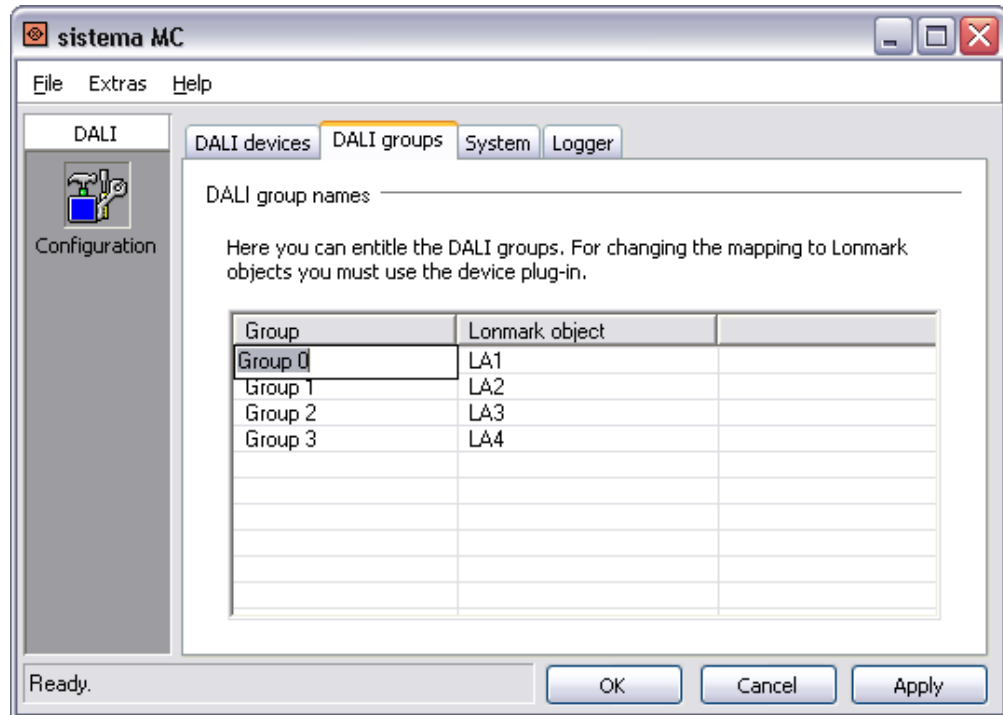
System

Here you can set the DALI bus power supply. Select "internal" and the lumina DALx module will take over the power supply. If an external electricity supply is installed, the lumina DALx module supply must not be active. To do this set the value to "external". The "auto" setting should only be selected temporarily if you are unsure whether an external power supply has been installed.



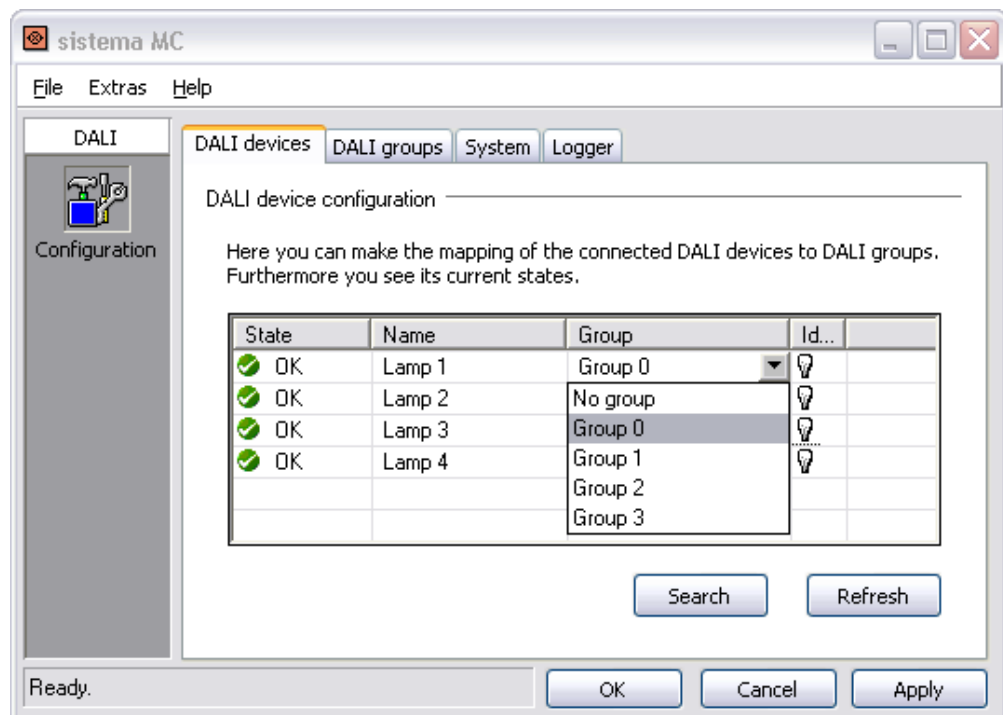
Naming DALI groups

This is where you can give the DALI groups corresponding names.



DALI devices

This is where the DALI devices are configured.



General

A brand new lumina DALx module does not feature any configuration as standard. This means the list of DALI devices is empty. To ensure connected devices can be controlled, they need to be made known to the module.

Adding DALI bus devices

The DALI bus devices to be controlled must be connected to the module. To add the connected devices to the list, click the "Search" button. Any devices found will be added to the list.

Assignment to DALI groups

The devices must now be assigned a DALI group each. Click in the "DALI group" column of the relevant device and select the desired group. For the purpose of identifying the individual DALI devices, click the light symbol in the line of the corresponding device. Flashing of the relevant light is switched on or off in this way. Alternatively, you may use the group assistant to assign the groups; this helps to simplify work in installations with a large number of DALI stations. Click "Group assistant" and follow the instructions. Click "Accept" to save the configuration.

Light status display

The individual DALI device symbols show whether communication with the relevant device is taking place and whether the device is showing an error. The display can be updated by clicking "Update". Please note that DALI devices, once added, must first be made known to the module - by clicking "Accept" - before their status can be retrieved.

Group parametrization

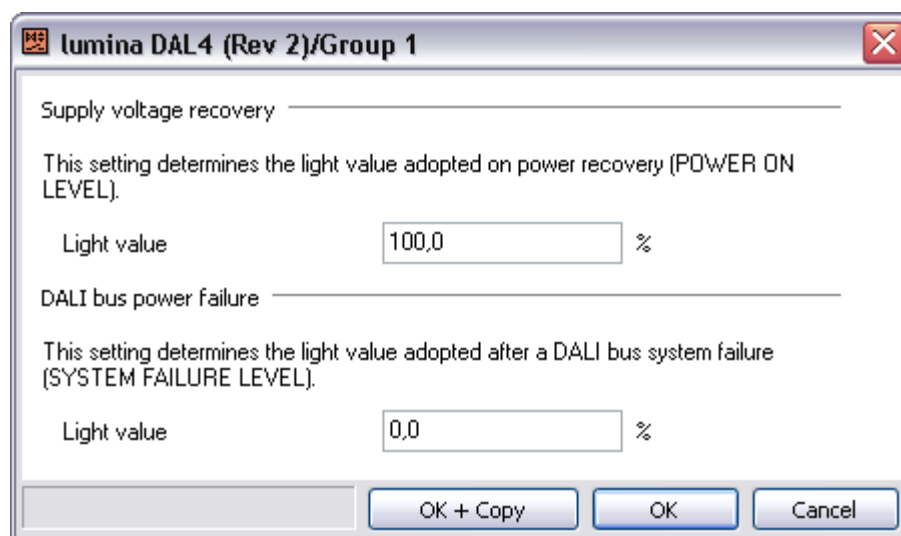
The group parametrization function is reached by selecting the "Settings" button. A type must first be assigned to each group, after which specific settings can be made.

Group type

With the lumina DALx-type module only DALI lighting can be selected as a type.

Settings

The DALI lighting group type is used for DALI ballasts.



Copying parameters

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Saving and loading configurations

The DALI bus configuration can be saved in a file in the plug-in and restore from the file. In this way modules can be replaced without the need for lengthy reconfiguration.

Replacing a module

When the DALI module is configured via RS232, you should save the configuration in a file, if you have not already done so, before replacing the module.

During the configuration via LON, the module configuration is also saved in the LNS project database (e.control Plug-ins V2.10 or higher), so that a backup in a file is no longer necessary. This allows a comfortable module replacement.

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

You can now run the DALI bus configuration from the device plug-in. On configuration via RS232 load the saved configuration file in the plug-in and accept the settings.

On configuration via LON a module replacement is automatically detected by the configuration software. The saved configuration is stored in the new module. Now the DALI bus is again ready for operation.

Replacing a bus node

If a DALI bus device needs to be replaced, the device in question must first be removed from the list before a new device is added. For further details refer to the sections entitled "Removing MP bus devices" and "Adding DALI bus devices" in Chapter "Configuring the DALI bus".

Extended status feedback

Configured lumina DALx modules can detect DALI device status and lamp status. The device management supports an output of these states via network variable. Usually the lamp status can only be detected and reported by the DALI ballast if it has received a switch-on command. This also applies to tracking back failures. Following states can be detected:

Status	type of failure
DALI device reporting lamp failure	peripheral failure on the sub-bus device
DALI device reporting device failure	sub-bus device failure
DALI device is offline	sub-bus device communication error
No DALI power supply or short circuit on DALI-bus	sub-bus device communication error

4.3.7 lumina SAx

The lumina SA4 and lumina SA8 switch actuator modules are used for activating electrical consumers.

The following documentation is valid for modules with:

Revision	2
Hardware version	001.000
Firmware version	001.017

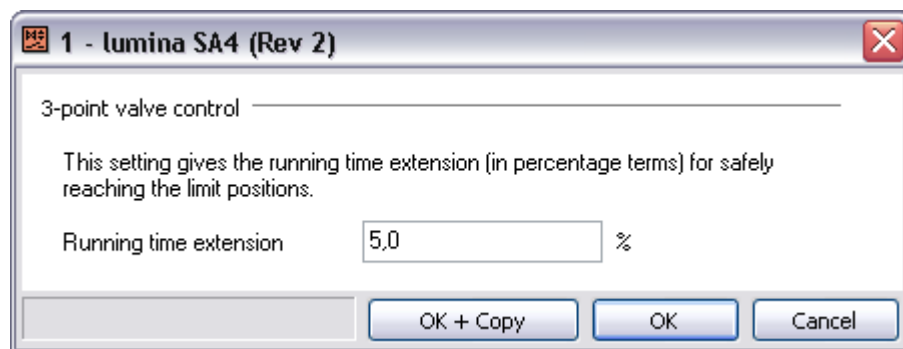
Modules

The modules listed are grouped under the module type lumina SAx:

Module types	Number of channels
lumina SA4 (Rev 2)	4
lumina SA8 (Rev 2)	8

Module parametrization

The module is parameterized in the device plug-in on the tab of the corresponding module. The module parameters can be accessed via the "Module settings" button.



Channel parametrization

A type must first be selected for each channel. Further settings can be made depending on the channel type.

Channel types

With the lumina SAx-type modules there are 3 types of channel to choose from:

lumina SA4 (Rev 2)

Channel	Name	Type	
1	Channel 1	Not used	Settings
2	Channel 2	Not used Switched load Valve (2-P.) Valve (3-P.)	Settings
3	Channel 3	Not used	Settings

With 3-point valves two channels must be used. They can only be set on "uneven" channels and also uses the next channel up.

Settings

The available settings for the channel depend on the type.

Switched load

This type may be used where a simple switched load is connected.

lumina SA4 (Rev 2)/Channel 1

Mode of action

This setting determines the action of the relay.

On ON the relay is

Closed

Closed
Opened

OK + Copy OK Cancel

Valve (2-point)

This channel type is used for 2-point actuators and thermoelectric drives. For quasi-continuous control, pulse width modulation can be parameterized in the assigned HVAC object.

The screenshot shows the 'lumina SA4 (Rev 2)/Channel 1' configuration window. It has a title bar with a red close button. The window contains the following fields and options:

- Mode of action**: A text label followed by a horizontal line.
- This setting determines the action of the valve drive.**: A descriptive text line.
- Valve is normally**: A dropdown menu currently showing 'Closed (NC)'.
- Maintenance**: A dropdown menu with 'Closed (NC)' and 'Opened (NO)' options.
- This setting determines the valve flush duration to protect against jamming when the valve is closed. Note: the servicing frequency is defined in the object.**: A descriptive text line.
- Valve flush duration**: A text input field containing '300' followed by a unit 's'.
- Buttons**: 'OK + Copy', 'OK', and 'Cancel' buttons at the bottom right.

Valve (3-point)

This channel type must be selected when connecting 3-point actuators.

The screenshot shows the 'lumina SA4 (Rev 2)/Channel 1' configuration window for a 3-point valve actuator. It includes the following fields and options:

- Mode of action**: A text label followed by a horizontal line.
- This setting determines the action of the triac outputs for controlling the drive.**: A descriptive text line.
- Mode of action**: A dropdown menu currently showing 'Normal'.
- Maintenance**: A dropdown menu with 'Normal' and 'Inverted' options.
- This setting determines the valve flush duration to protect against jamming when the valve is closed. Note: the servicing frequency is defined in the object.**: A descriptive text line.
- Valve flush duration**: A text input field containing '300' followed by a unit 's'.
- Running time**: A text label followed by a horizontal line.
- This setting determines the running time between both limit positions of the valve.**: A descriptive text line.
- Running time**: A text input field containing '20,0' followed by a unit 's'.
- Calibration**: A text label followed by a horizontal line.
- These settings determine the positioning calibration following relative positioning movements.**: A descriptive text line.
- Calibrate after**: A text input field containing '50' followed by the unit 'movements'.
- Reference position**: A dropdown menu currently showing 'Closed'.
- Buttons**: 'OK + Copy', 'OK', and 'Cancel' buttons at the bottom right.

Copying parameters

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Replacing a module

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

4.3.8 lumina ST4

The lumina ST4 lighting actuator module is used to activate electronic ballasts with a 1-10V interface.

The following documentation is valid for modules with:

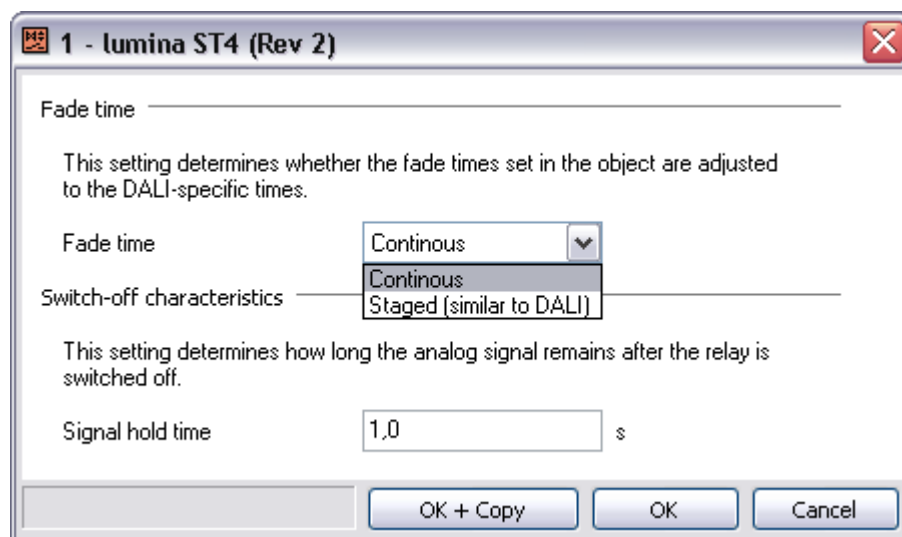
Revision	2
Hardware version	001.000
Firmware version	005.003

Module

Module types	Number of channels
lumina ST4 (Rev 2)	4

Module parametrization

The module is parameterized in the device plug-in on the tab of the corresponding module. The module parameters can be accessed via the "Module settings" button.



Channel parametrization

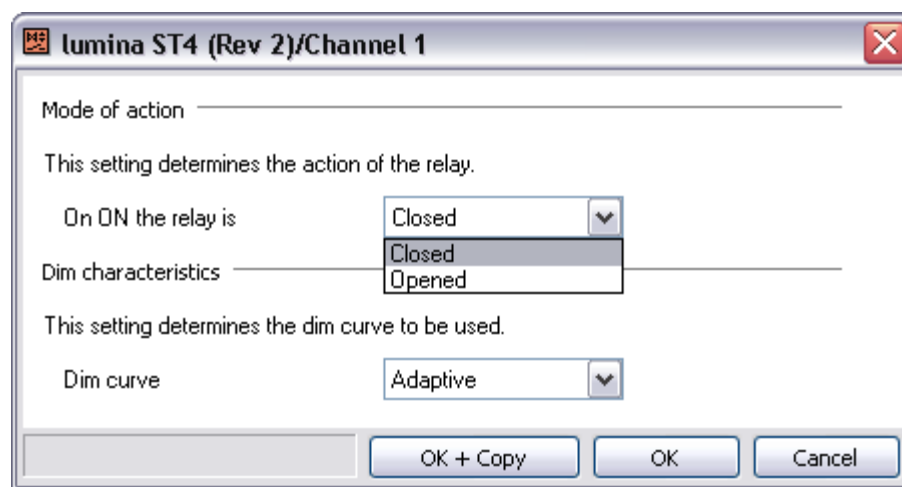
A type must first be selected for each channel. Further settings can be made depending on the channel type.

Channel types

Only dimmed lighting can be selected as a channel type for the lumina ST4 module.

Settings

The dimmed lighting channel type is used for activating dimmable ballasts.



Copying parameters

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Replacing a module

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

4.3.9 ombra BAx

The ombra BA2, ombra BA4 and ombra BA4-DC sunblind actuator modules feature mutually interlocked connections for controlling sunblind motors.

The following documentation is valid for modules with:

Revision	2
Hardware version	001.000
Firmware version	001.017

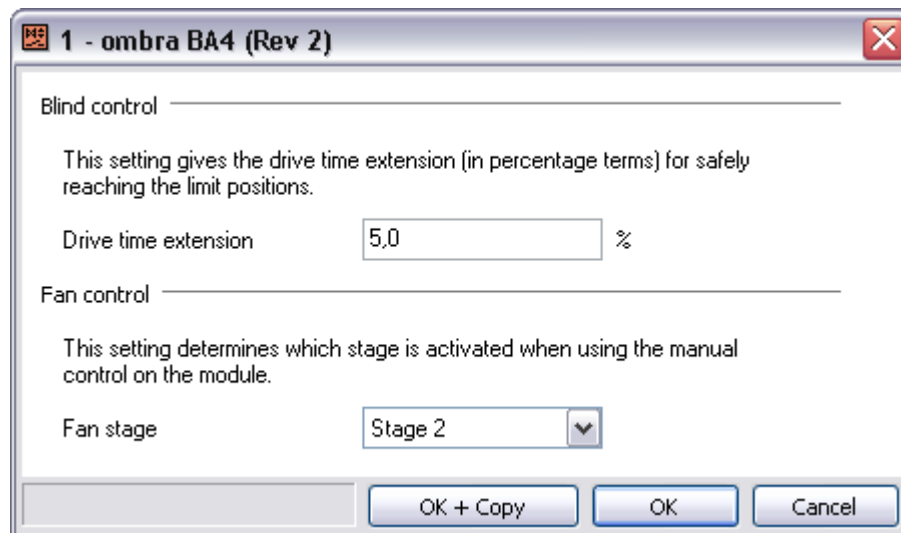
Modules

The modules listed are grouped under the module type ombra BAx:

Module types	Number of channels
ombra BA2 (Rev 2)	2
ombra BA4 (Rev 2)	4
ombra BA4-DC (Rev 2)	4

Module parametrization

The module is parameterized in the device plug-in on the tab of the corresponding module. The module parameters can be accessed via the "Module settings" button.



Channel parametrization

A type must first be selected for each channel. Further settings can be made depending on the channel type.

Channel types

With the ombra BAx-type modules there are 7 types of channel to choose from:

ombra BA4 (Rev 2)

Channel	Name	Type	
1	Channel 1	Not used	Settings
2	Channel 2	Not used	Settings
3	Channel 3	Shutter	Settings
4	Channel 4	Awning	Settings
		Venetian blind	Settings
		Window	Settings
		Switched load	Settings
		Fan (on/off)	Settings
		Fan (2-stage)	Settings

Settings

The available settings for the channel depend on the type.

Shade

This channel type is offered for controlling shades.

ombra BA4 (Rev 2)/Channel 1

Mode of action _____
This setting determines the action of the relays.

Mode of action

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position

Motor changeover _____
This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay s

Positioning _____

Drive time DOWN s

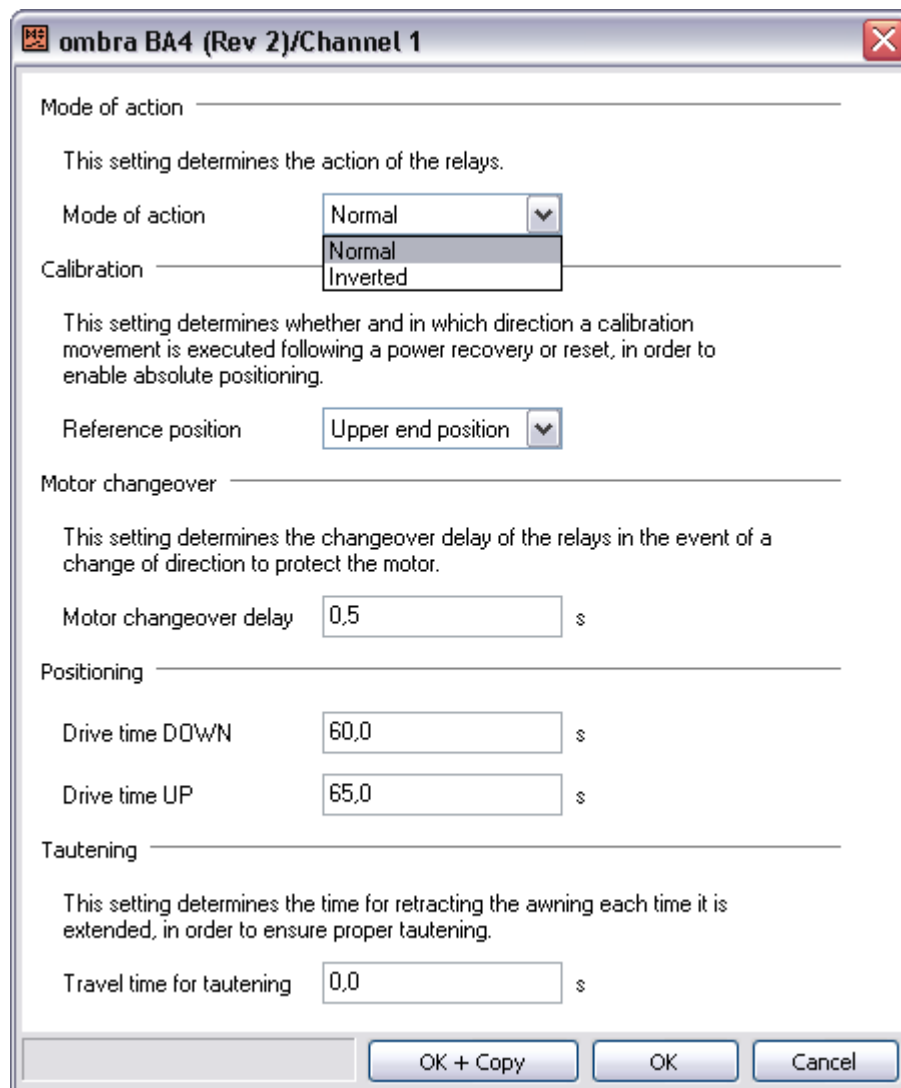
Drive time UP s

Shutter slot opening _____
This setting determines the time for raising the shutter once the lower limit position is reached, in order to ensure proper rear ventilation.

Travel time for opening s

Awning

This channel type is provided for controlling awnings.



ombra BA4 (Rev 2)/Channel 1

Mode of action _____

This setting determines the action of the relays.

Mode of action ▼

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position ▼

Motor changeover _____

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay s

Positioning _____

Drive time DOWN s

Drive time UP s

Tautening _____

This setting determines the time for retracting the awning each time it is extended, in order to ensure proper tautening.

Travel time for tautening s

Blind

This channel type is offered for controlling blinds.

ombra BA4 (Rev 2)/Channel 1

Mode of action _____

This setting determines the action of the relays.

Mode of action Normal ▼

Calibration Normal
Inverted

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position Upper end position ▼

Motor changeover _____

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay 0,5 s

Positioning _____

☐ Wizard-based evaluation

last executed on

Start wizard

☒ Manual input

Drive time DOWN 60,0 s

Drive time UP 65,0 s

Mechanical slip 0,00 s

Slat turn time 2,00 s

Lower hysteresis 0,00 s

Upper hysteresis 0,00 s

OK + Copy OK Cancel

Window

Windows are controlled using this channel type.

ombra BA4 (Rev 2)/Channel 1

Mode of action

This setting determines the action of the relays.

Mode of action: Normal

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position: Closed

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay: 0,5 s

Positioning

Drive time OPEN: 60,0 s

Drive time CLOSE: 65,0 s

OK + Copy OK Cancel

Switched load

This type may be used where a simple switched load is connected.

ombra BA4 (Rev 2)/Channel 1

Mode of action

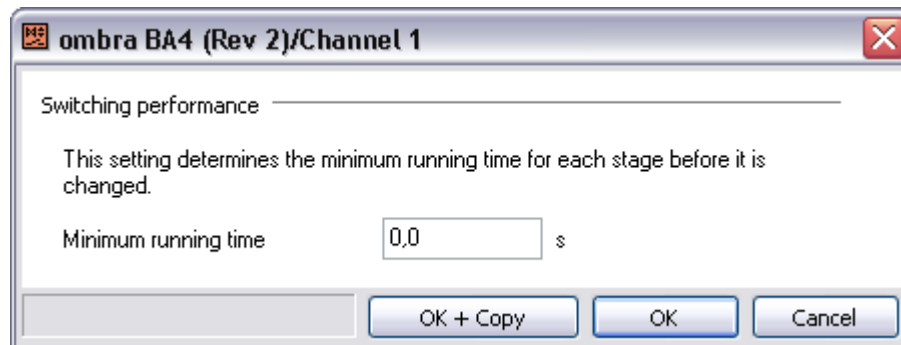
This setting determines the action of the relay.

On ON the relay is: Closed

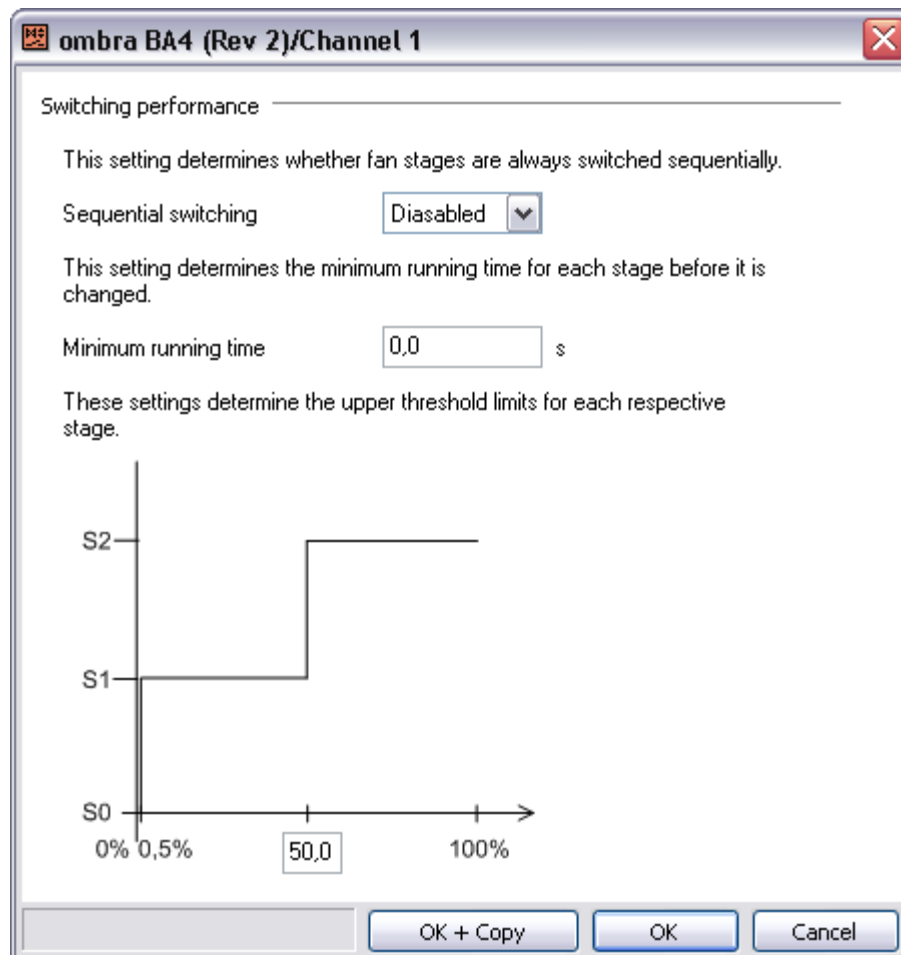
OK + Copy OK Cancel

Fan (on/off)

This channel type is used for fans which are only switched on or off.

**Fan (2-stage)**

This channel type is used for controlling fans with two switching stages.



Copying parameters

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Replacing a module

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

4.3.10 ombra BA2-3E

The ombra BA2-3E sunblind actuator is used to control sunblind motors with 3 end positions.

The following documentation is valid for modules with:

Revision	2
Hardware version	001.000
Firmware version	001.017

Module

Module types	Number of channels
ombra BA2-E (Rev 2)	2

Module parametrization

The module is parameterized in the device plug-in on the tab of the corresponding module. The module parameters can be accessed via the "Module settings" button.

1 - ombra BA2-3E (Rev 2)

Blind control

This setting gives the drive time extension (in percentage terms) for safely reaching the limit positions.

Drive time extension %

This setting gives the closing time of slats from the working position (2nd limit position) to the closing position (3rd limit position). It corresponds to several times the slat opening time (see channel setting).

Slat closing time factor

This setting determines which position of the 3-end-position blind is approached when using the manual control on the module.

Blind position

Fan control

This setting determines which stage is activated when using the manual control on the module.

Fan stage

OK + Copy OK Cancel

Channel parametrization

A type must first be selected for each channel. Further settings can be made depending on the channel type.

Channel types

With the ombra BA2-3E module there are 9 types of channel to choose from:

ombra BA2-3E (Rev 2)

Channel	Name	Type	
1	Channel 1	Shutter	Settings
2	Channel 2	Awning Venetian blind Venetian blind 3 end Window Switched load Fan (on/off) Fan (2-stage) Fan (3-stage)	Settings

Settings

The available settings for the channel depend on the type.

Shade

This channel type is offered for controlling shades.

ombra BA2-3E (Rev 2)/Channel 1

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay s

Positioning

Drive time DOWN s

Drive time UP s

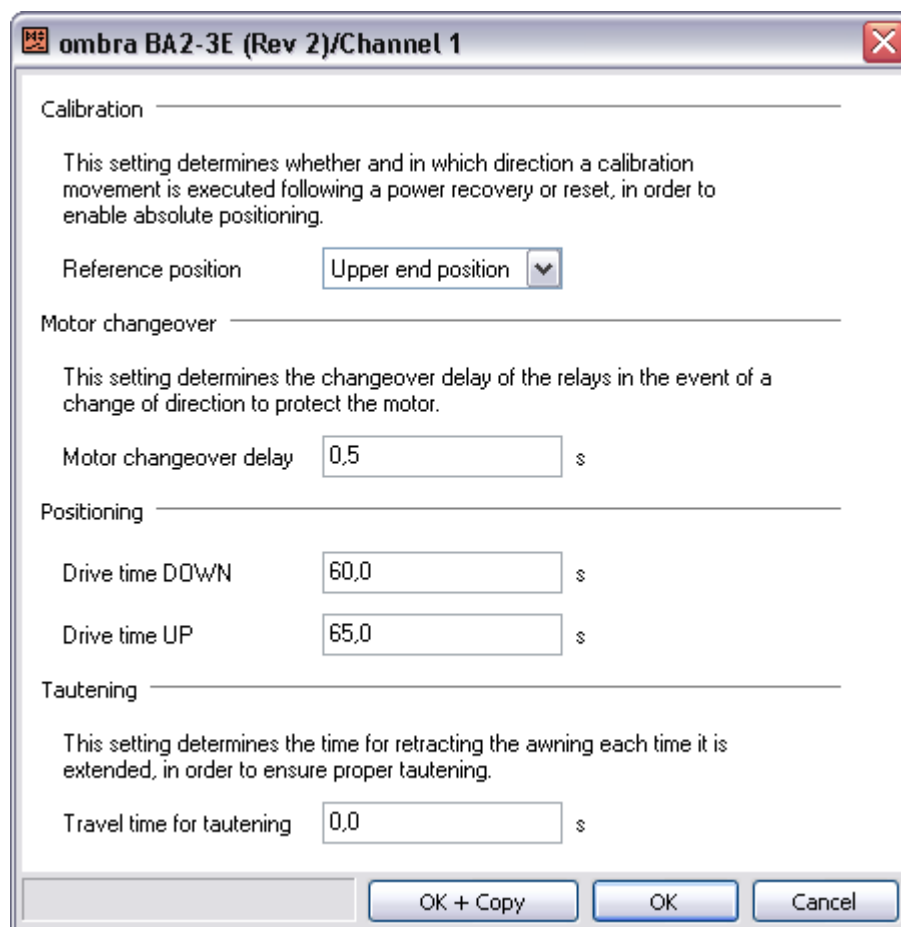
Shutter slot opening

This setting determines the time for raising the shutter once the lower limit position is reached, in order to ensure proper rear ventilation.

Travel time for opening s

Awning

This channel type is provided for controlling awnings.



ombra BA2-3E (Rev 2)/Channel 1

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position: Upper end position ▼

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay: 0,5 s

Positioning

Drive time DOWN: 60,0 s

Drive time UP: 65,0 s

Tautening

This setting determines the time for retracting the awning each time it is extended, in order to ensure proper tautening.

Travel time for tautening: 0,0 s

OK + Copy OK Cancel

Blind

This channel type is offered for controlling blinds.

ombra BA2-3E (Rev 2)/Channel 1

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position: Upper end position ▼

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay: 0,5 s

Positioning

☐ Wizard-based evaluation

last executed on:

Start wizard

☒ Manual input

Drive time DOWN: 60,0 s

Drive time UP: 65,0 s

Mechanical slip: 0,00 s

Slat turn time: 2,00 s

Lower hysteresis: 0,00 s

Upper hysteresis: 0,00 s

OK + Copy OK Cancel

Blind, 3 end positions

This channel type should be used for sunblinds with 3 end positions.

ombra BA2-3E (Rev 2)/Channel 1

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position Upper end position ▼

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay 0,5 s

Positioning

☐ Wizard-based evaluation

last executed on

Start wizard

☒ Manual input

Drive time DOWN 60,0 s

Drive time UP 65,0 s

Mechanical slip 0,00 s

Slat turn time 2,00 s

Slat open time 3,0 s

Lower hysteresis 0,00 s

Upper hysteresis 0,00 s

OK + Copy OK Cancel

Window

Windows are controlled using this channel type.

ombra BA2-3E (Rev 2)/Channel 1

Calibration

This setting determines whether and in which direction a calibration movement is executed following a power recovery or reset, in order to enable absolute positioning.

Reference position: Closed

Motor changeover

This setting determines the changeover delay of the relays in the event of a change of direction to protect the motor.

Motor changeover delay: 0,5 s

Positioning

Drive time OPEN: 60,0 s

Drive time CLOSE: 65,0 s

OK + Copy OK Cancel

Switched load

This type may be used where a simple switched load is connected.

ombra BA2-3E (Rev 2)/Channel 1

Mode of action

This setting determines the action of the relay.

On ON the relay is: Closed

OK + Copy OK Cancel

Fan (on/off)

This channel type is used for fans which are only switched on or off.

ombra BA2-3E (Rev 2)/Channel 1

Switching performance

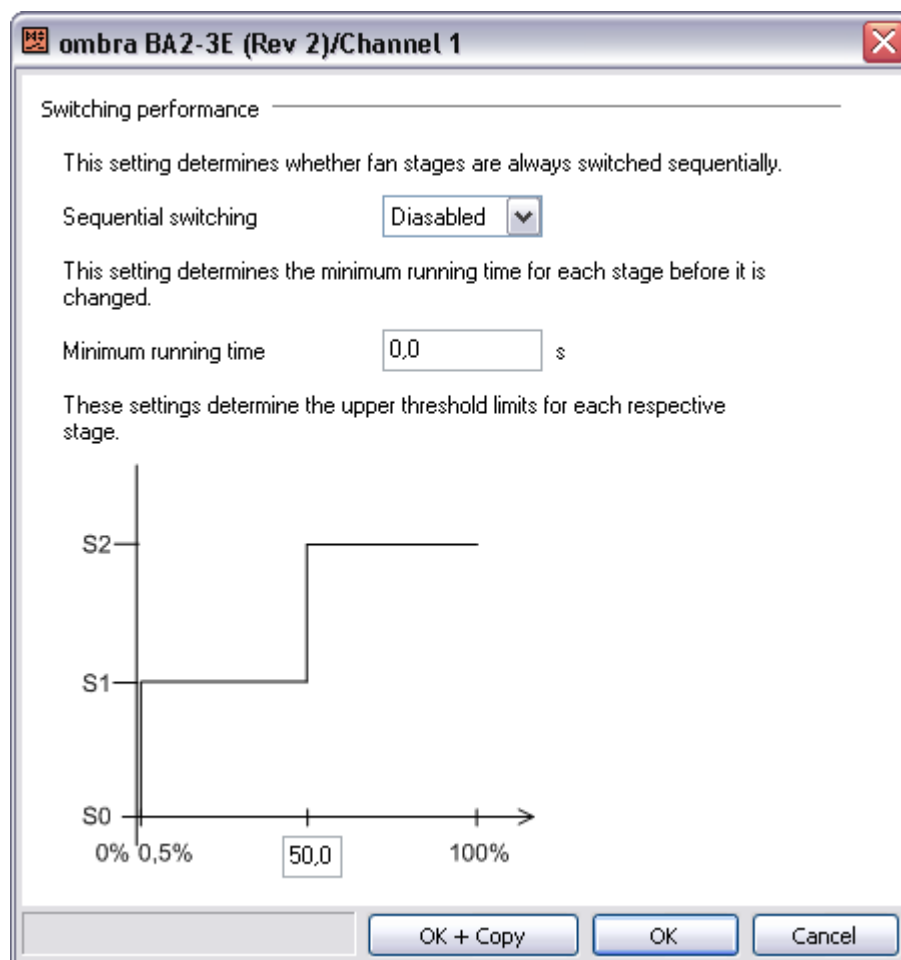
This setting determines the minimum running time for each stage before it is changed.

Minimum running time: 0,0 s

OK + Copy OK Cancel

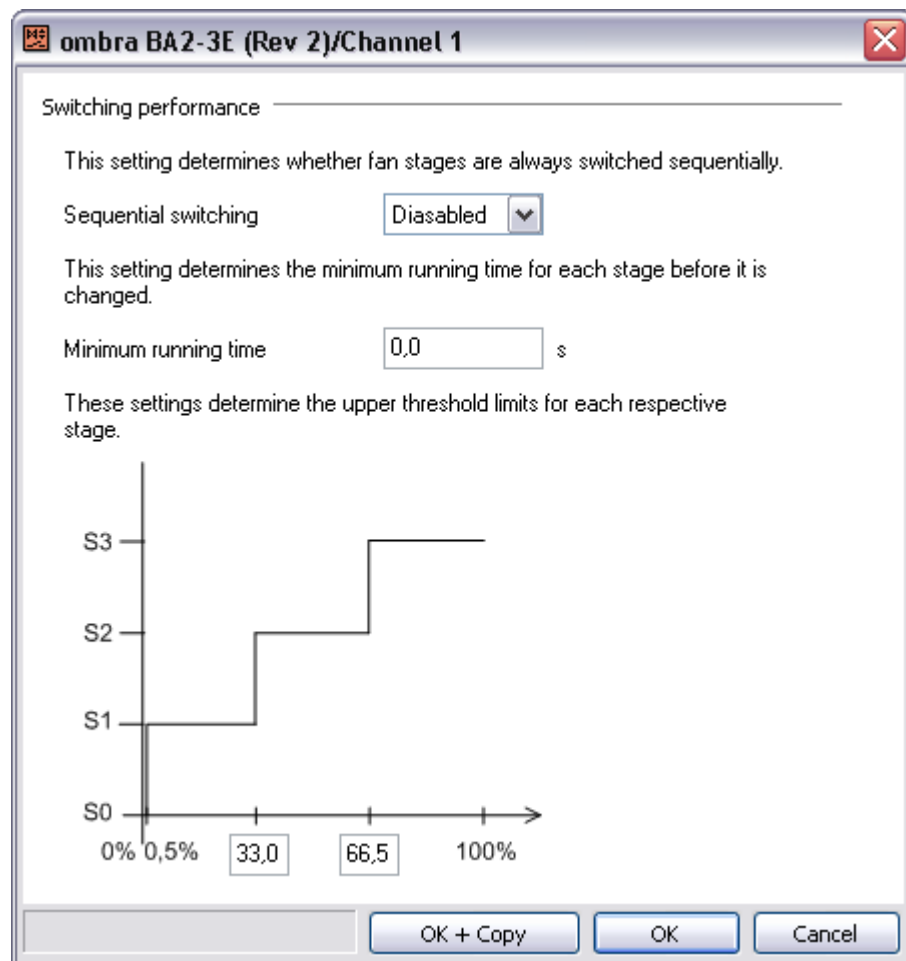
Fan (2-stage)

This channel type is used for controlling fans with two switching stages.



Fan (3-stage)

This channel type is used for controlling fans with three switching stages.

***Copying parameters***

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Replacing a module

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

4.3.11 ombra BAX-SMI

The ombra BA4-SMI, ombra BA8-SMI and ombra BA16-SMI blind actuator modules are used to activate up to 16 SMI motors.

The following documentation is valid for modules with:

Revision	2
Hardware version	001.000
Firmware version	002.000 or higher

Modules

The modules listed are grouped under the module type ombra BAX-SMI:

Module types	Number of groups	Addressing mode
ombra BA4-SMI (Rev 2)	4	group addressing
ombra BA8-SMI (Rev 2)	8	single addressing
ombra BA16-SMI (Rev 2)	16	single addressing

Module parametrization

The module is parameterized in the device plug-in on the tab of the corresponding module. The module parameters can be accessed via the "Module settings" button.

1 - ombra BA4-SMI (Rev 2)

Max motor drive time

This setting limits the run time of the motor in one direction.

Max motor drive time \$

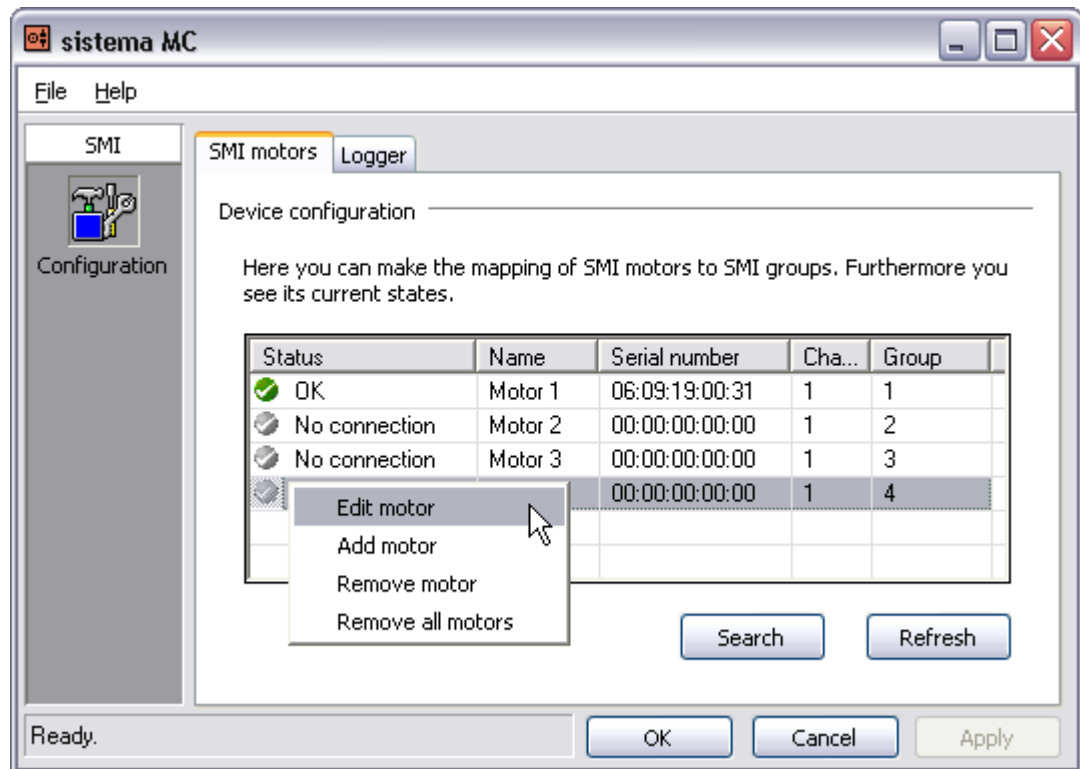
Behaviour on module mains voltage failure

This setting determines whether a module mains voltage failure is evaluated as an failure. In case of disconnecting SMI motors from the mains voltage at night you are able to suppress the failure indication when you also disconnect the module mains voltage at the same time.

Failure indication

Configuring the SMI-Bus

You can start the configuration of the SMI bus in the device plug-in on the tab of the corresponding module by clicking "Configure SMI bus". This is only required for SMI modules which use single addressing.



General

A brand new ombra BAX-SMI module does not feature any configuration as standard. This means the list of SMI motors is empty. To ensure connected motors can be controlled, they need to be made known to the module. This can be done in two ways.

Adding motors

If the motors to be controlled are connected to the module, click the "Search" button. Any motors founds will be added to the list with their unique serial numbers. If the motors to be controlled are not connected to the module, you can select "Add motor" in the context menu by right-clicking the list. A dialog box will appear in which you can enter the serial number of the desired motor. Click "Accept" to save the motor data entered or found.

Assignment to SMI groups

To assign the motors to individual SMI groups, click in the "Group" column of the motor in question and select the desired group number. Select "Edit motor" in the context menu to identify the individual motors. The next dialog box to open will allow you to operate the motor.

Motor status display

The symbols in front of the individual motors show whether communication with the motor concerned is possible. The display can be updated by clicking "Update". Please note that motors, once added, must first be made known to the module - by clicking "Accept" - before their status can be retrieved.

"Channel" column

The "Channel" column shows the physical channel of the module to which a motor is connected. This channel has nothing in common with the channel in the device plug-in.

Removing motors

To delete motors from the configuration, open the context menu on the motor concerned and select "Remove motor". Click "Accept" to save the list of motors displayed.

Channel/Group parametrization

The channel parametrization function is reached by selecting the "Settings" button. A type must first be assigned to each channel, after which specific settings can be made.

With SMI modules which use single addressing, it is called "group" instead of "channel". Afterwards the term "channel" is used.

Channel/Group types

With the ombra BA4-SMI-type modules there are 3 types of channel to choose from:

ombra BA4-SMI (Rev 2)

Channel	Name	Type	
1	Channel 1	Not used	Settings
2	Channel 2	Not used Shutter Awning Venetian blind	Settings
3	Channel 3	Not used	Settings

Settings

Additional properties, which are adjustable on the channel, are only required for the 'blind' channel type.

Positioning

☐ Wizard-based evaluation

last executed on

☒ Manual input

Mechanical slip steps

Slat turning steps

Lower hysteresis steps

Upper hysteresis steps

To ensure the slat angle is positioned as precisely as possible, physical properties for the blind used must be entered here. As these values are difficult to ascertain, an assistant function is provided to give you the best possible guidance. To run the assistant, select "Find with assistant" and click "Start assistant". Follow the instructions on the assistant screen.

Note: Further parameters for the blind used which are also required for precise control must be set in the plug-in of the assigned object.

Copying parameters

Both module and channel parameters can be copied by means of the relevant dialog boxes using "OK + Transfer" to other compatible modules or channels of the same devices or other devices in the project. For details on copying parameters please see the section on "Copying configurations".

Replacing a module

During the SMI configuration, the module configuration is also saved in the LNS project database (e.control Plug-ins V2.10 or higher). This allows a comfortable module replacement.

To replace a module, you must first ensure that the combination of devices is de-energized and all connecting cables removed. Release the module from the combination of devices by pushing the modules apart. Replace it with a module of the same type and revision. Push the combined unit with the new module back together. Re-connect all cables and lines. Information on connecting and assembling the modules can be found in the section entitled "Product description".

You can now run the SMI configuration from the device plug-in. A module replacement is automatically detected by the configuration software. The saved configuration is stored in the new module. Now the SMI bus is again ready for operation.

Backup and restore of the module configuration per file is also available.

Replacing a bus node

If an SMI motor needs to be replaced, the motor in question must first be removed from the list before a new motor is added. For further details refer to the sections entitled "Removing motors" and "Adding motors" in Chapter "Configuring the SMI bus".

Extended status feedback

Configured ombra BAX-SMI modules can detect states of MP-bus devices. The device management supports an output of these states via network variable. Following states can be detected:

Status	Type of failure
SMI motor reporting failure	sub-bus device failure
No assigned SMI motor found	sub-bus device communication error
An already configured motor could not be found	sub-bus device communication error
short circuit on SMI bus or module mains voltage failure	sub-bus device communication error*

4.4. Object configuration

The applications provide universal objects. The type of each object as to be set in the device plug-in as described in the relevant section. According to the usage of the objects the functionality and parametrization vary. A detailed description of the various object types gives the following section.

4.4.1 Lamp actuator

The lamp actuator is used to activate switching and dimming actuators and can be adapted as required by parameterizing the object functions. Depending on the application version, the actuator object provides one or two network input variables, which are used to activate the actuator. The use of group objects means that additional input variables are available for central functions. Furthermore, each object sends back the current status of the actuator on its network output variable.

Overview of object functions

Extended functions are supported in addition to the VDI 3813-compliant room automation functions.

VDI3813 – Functions

- Light actuator
- Space usage selection
- Light switch
- Stairwell lighting
- Priority evaluation
- Sequence control
- Output range control

Extended function

- Switchable network variable types
- Output network variable transmission response
- Action in the event of communication faults
- Action following resumption of power supply/reset
- Activation via groups

It should be noted that the light switch and stairwell lighting functions cannot be used together.

Parametrization of object functions

The objects are parameterized using the corresponding object plug-ins. These can be started directly on the object from the device plug-in or in the LNS tool.

Action following resumption of power supply or reset

The response following the resumption of a power supply or RESET can be parameterized. Here either a status for switching actuators or a precise light value for

dimming actuators can be specified. You can also specify that no command should be executed. Parametrization is carried out in the object plug-in on the "General" tab.

On voltage recovery or reset _____

☒ Do nothing
☐ Switch off
☐ Switch on
☐ Set light value to %

Depending on the hardware activated the actuator's light value definition function can be deactivated until the actuator has received and executed a new light value. If the light value cannot be determined correctly, the output network variable will send back an invalid value.

Light actuator

The actuator object can activate both switching and dimming actuators. Control output values are set as follows, depending on the type of NV and actuator:

SNVT_setting	SNVT_switch	Switching actuator	Dimming actuator
(SET_OFF, x, y)	(x, 0)	OFF	OFF
(SET_ON, 0.0, y)	(0, 1)	OFF	OFF
(SET_ON, x > 0, y)	(x > 0, 1)	ON	Light value x
(SET_DOWN, x, y)	(x, 2)	-	Dim down by x (no switch-off)
(SET_UP, x, y)	(x, 3)	-	Dim up by x (no switch-on)
(SET_STOP, x, y)	(x, 4)	-	Stops the dimming process
(SET_STATE, 0.0, y)	(0, 5)	OFF	OFF
(SET_STATE, x > 0, y)	(x > 0, 5)	ON	Light value x

With dimming actuators the dimming response can be adjusted as required by varying the fade time. Parametrization is carried out in the object plug-in on the "Dimming" tab.

Dim settings _____

This setting affects dim channels only.

Fade time s

The fade time determines the duration of the dimming process from the current light value to the next light value requested. It is independent of the difference between the light values.

Light switch

To implement light switch functions which comply with VDI 3813, separate time delays for switching-on and switching-off procedures can be specified. In addition, it is possible to specify for each priority used for priority control whether the switching-on and switching-off delays should be taken into account. This setting can be made in the object plug-in on the "Delays" tab.

Delays

The configured delays are only taken into consideration when commands on the selected priorities are received.

Note: These settings are only available when the stairwell lighting function is not in use.

☒ Auto
☐ Manual
☐ Override 1
☐ Weather
☐ Override 2
☐ Safety

Switch-on delay s
Switch-off delay s

You can activate the delay function by selecting a priority. If no priority is selected, the delays will not be activated. Please note that delays and stairwell lighting cannot be used together.

Stairwell lighting

The lighting actuator can be used for stairwell lighting complying with VDI 3813. In stairwell lighting mode the actuator automatically switches off the lighting once the parameterizable lighting duration has elapsed. Where configured, the stairwell lighting duration is followed by a warning period which provides information that the lighting is about to be switched off. Here dimming actuators change their light value during the warning period to a warning light value and switching actuators flash at the set warning intervals. In cases where the premature switch-off function is used, the actuator is switched off prematurely as soon as a switch-off command is received. Switch-off commands are otherwise ignored. If the lighting duration can be extended, an active stairwell lighting period is re-started when a switch-on command is received. In addition, it is possible to specify for each priority used for priority control whether the stairwell lighting switch is used. Parametrization of the stairwell lighting is carried out in the object plug-in on the "Stairwell lighting" tab.

Stairwell light settings

The stairwell lighting configuration is only taken into consideration when commands on the selected priorities are received.

Note: These settings are only available when no delays are configured.

- ☐ Auto
- ☒ Manual
- ☐ Override 1
- ☐ Weather
- ☐ Override 2
- ☐ Safety

Lighting period	90	s
Warning time	10	s
Warning flash interval (SA)	5	s
Warn light value (DA)	50,0	%
Early switch-off	No	▼
Light duration extendable	Yes	▼
	No	
	Yes	

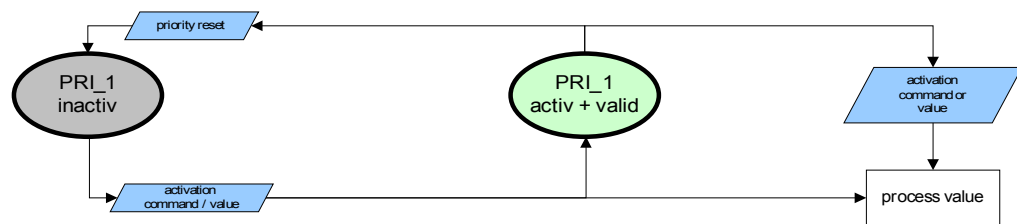
You can activate the stairwell lighting function by selecting a priority. If no priority is selected, the stairwell lighting function will not be activated. Please note that the stairwell lighting and light switch functions cannot be used together.

Priority evaluation

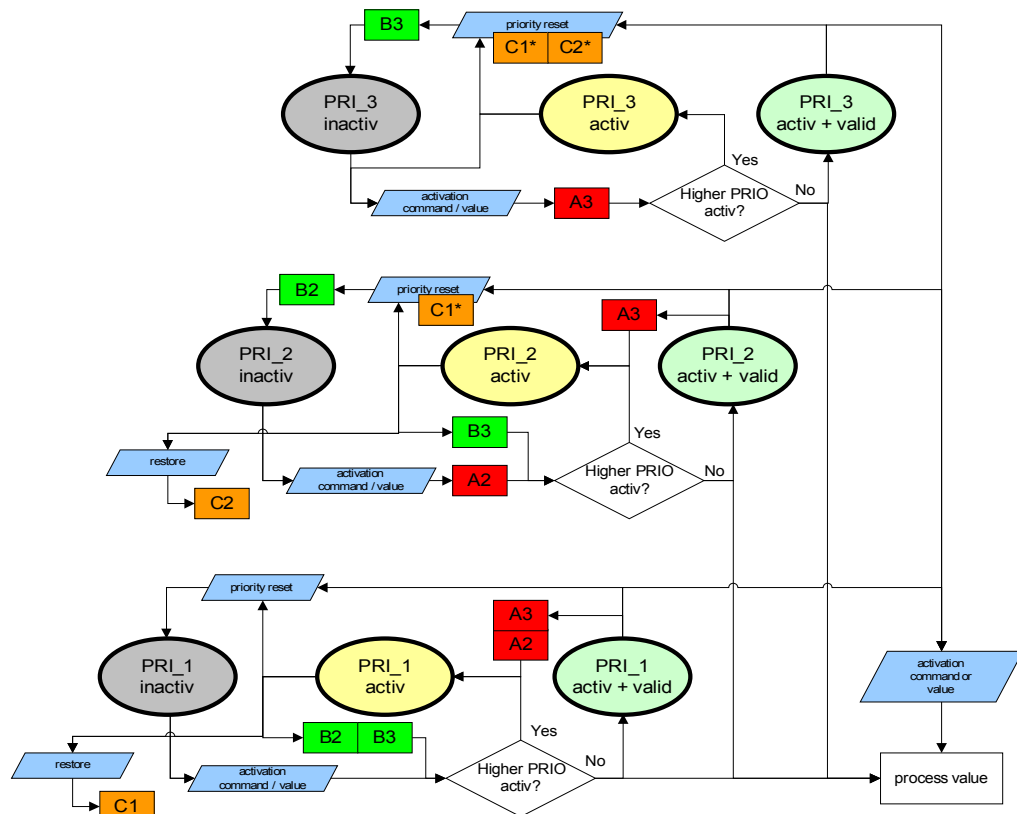
The object is activated via the input network variables. By setting priorities various input variables can be sorted according to their importance. In this way mutual interference caused by activation from more than one source can be avoided. Priority evaluation is parameterized via the object plug-in. If group objects are used as control sources, parts of the priority evaluation must also be set here in the relevant object plug-in.

Principle of operation

Each priority has two initial states. Either valid activation values are received, in which case the priority is considered active, or the activity is explicitly retracted, whereby an 'invalid' value is sent.



In the case of a single priority the status diagram shown above applies. As soon as other priorities are added they must be mutually interlocked.



As a result each priority is given a further status. It may now be active, however its values may not be executed due to a higher-weighted priority. It loses its validity as soon as a higher priority is activated (Ax events). On the other hand, a priority may regain its validity as soon as the last higher priority is retracted (Bx events) or it replaces higher priorities itself (Cx events). In cases where a priority becomes valid again because a higher priority has been retracted, it is possible to stipulate for the re-validated priority how it should handle this event.

Parametrization

A full overview of the room and central functions in which the lighting actuator is involved is vital for setting the priority evaluation parameters. For this reason the configuration stages are described using an example.

Example A light switch linked to a motion sensor is to be implemented in an office, with manual operation of the lighting also enabled. A manually reduced light value must not be reset by any new motion which is sensed. However the lighting must also switch itself off even after manual operation, if it can be assumed that there is no longer anyone present in the room.

Step 1 – Selection of input variables

1 or 2 input network variables are available on the object, depending on the application. Group objects may also be used for other input variables. The inputs on the object are best suited for local functions and groups are suitable for central functions.

Example In our example both functions can be considered as a local function, such that the 2 input network variables can be used where available. If only 1 input variable is present, it is recommended that a group object is used for the stairwell lighting.

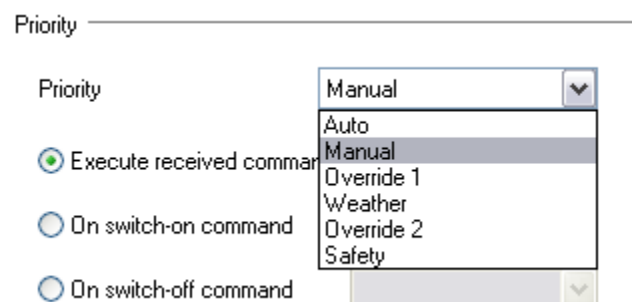
Step 2 – Selection of priorities

Here you must first consider which priorities are suitable for implementing the functions. In total there are 6 different priorities available with the following weighting:

Automatic < Manual < Override 1 < Weather < Override 2 < Safety

Example In our example the 'Automatic' priority is suitable for the stairwell lighting and 'Manual' for manual operation.

The priority is set on the respective input network variable used, this also affects activation via groups (see section on groups). The priority can be set in the object plug-in on the tab of the corresponding input variable in the section entitled "Priority".



Step 3 – Defining the type of activation

There are 3 types of activation for each input network variable. This determines how the commands received are processed.

Setting	Meaning
Execute received command	Each telegram on the input variable is set directly as a new light value.
On switch-on command	If a switch-on command is received, the command specified is executed. A switch-off command causes the priority to be retracted.

Setting	Meaning
On switch-off command	If a switch-off command is received, the command specified is executed. A switch-on command causes the priority to be retracted.

The "On switch-on command" and "On switch-off command" types of activation use the following switch-on and switch-off commands, depending on the type of network variable used:

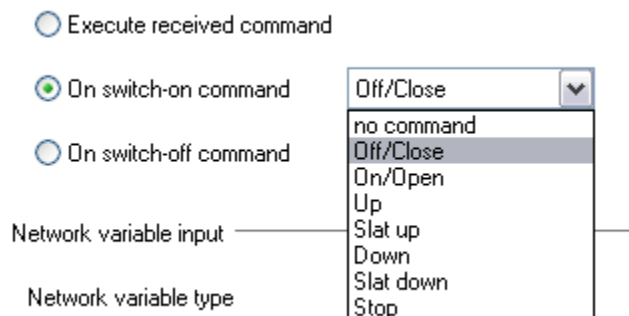
NV type	Switch-on command	Switch-off command
SNVT_switch	(100.0,1)	(0.0,0)
SNVT_setting	(SET_ON,100.0,0.00)	(SET_OFF,0.0,0.00)

On activating the priority, a series of different commands can be selected for the "On switch-on command" and "On switch-off command" types of activation, whereby those commands not listed are not relevant for the lamp actuator.

Command	Meaning
No command	The priority is activated, however no command is executed
Off/close	Switches off the lighting
On/open	Switches on the lighting

Example In our example we are using the "Execute received command" type of activation for both the light switch and manual operation. This allows us to stipulate that the object is activated with direct light values or dimming commands.

The type of activation is defined separately for each input network variable; this also relates to groups (see section on groups). It is set in the object plug-in on the tab of the corresponding input variable in the section entitled "Priority".



Step 4 – How is the activity of the priorities reset?

Priorities are usually reset via direct telegrams; here the corresponding invalid value should be sent, depending on the type of NV set. With the "On switch-on command" type of activation, switching-off causes the priority to be reset. The same applies when switching on using the "On switch-off command" type of activation. The invalid values for various types of NV are shown in the table:

NV type	Invalid value
SNVT_switch	(x, -1) any values are possible for x

NV type	Invalid value
SNVT_setting	(SET_NUL, x, y) any values are possible for x and y
SNVT_scene	The scene input called up must contain an invalid value (see section on scene control)

Example In this example no cancellation is required for the light switch, as this is already the lowest priority value. However we cannot cancel manual operation by standard means, therefore another solution is required.

If an activation source is not able to trigger a cancellation directly from an invalid value (e.g. manual operation), there are 2 mechanisms available for switching the priority off again. Both alternatives are also available when using groups.

Alternative 1 – Automatic priority cancellation

First of all, a period of validity can be specified on the corresponding input network variable. If the specified time elapses without new, valid control output values being received, this event is treated as though an invalid value for cancellation had been received. This invalid value must therefore be explicitly specified below the relevant input network variable. For using the automatic priority cancellation the corresponding network variable has to be bound.

Example This is the most suitable alternative for resetting manual operation. In this way we can stipulate how long a manual override remains valid.

Automatic priority cancellation is set in the object plug-in on the "NVI settings" tab in the section entitled "Heartbeat monitoring". It should be noted that this function cannot be used at the same time as the treatment of communications faults on the same input variable.

Heartbeat monitoring

☒ invalid after s

This value is executed on expiration of the period of validity.

Value

Value (RAW)

switch on
switch off
invalid
user defined

Automatic priority cancellation is activated by selecting "invalid after" and entering the desired period of validity. "Invalid" should be selected as a value in order to ensure cancellation of the priority on expiry of the period of validity.

Alternative 2 – Priority restore

The second mechanism allows an active though invalid priority to try to restore its validity by deactivating higher priorities by means of a special command.

Example In our example no priority restoration is required.

The restore mechanism applies across all objects for all network inputs with the same priority (even if on a group) and is configured in the object plug-in on the "Priority settings" tab in the section entitled "Restore behaviour".

Restore behaviour

These settings determine which of the selected higher priorities are reset when the selected command is sent on a network variable with the desired "NV priority".

NV priority	M	O1	W	O2	S	Command
Automatic	☒	☐	☐	☐	☐	No command
Manual	☐	☐	☐	☐	☐	No command
Override 1	☐	☐	☐	☐	☐	Off/Close
Weather	☐	☐	☐	☐	☐	On/Open
Override 2	☐	☐	☐	☐	☐	Up
						Slat up
						Down
						Slat down
						Stop

For each of the possible priorities you must first enter which of the higher priorities it can reset. If at least one priority is selected, the command must also be given as to which priority should initiate the reset. If this command is then received on the desired low priority, active priorities which are marked as resettable are reset. A priority reset can only be successfully implemented if no higher priorities are active after it. It should be noted that the return behaviour described below does not apply after a priority restoration.

Step 5 – Defining the return behaviour

The return behaviour describes what happens for each priority when it is reactivated because one/all higher priorities has/have been cancelled. You can choose between 3 different reactions for this object-wide setting:

Reaction	Description
None	The system waits until a new operating command is received which is then set normally.
Last abs. command	The last operating command received (absolute) is executed. Operating commands which were received when the priority was still active but invalid are also taken into account here.
Command	A specific command is executed

It should be noted that the response following a reset (see previous section) cannot be specified, it always corresponds to the reaction "none". To execute a specific command it is possible to choose between the commands listed, depending on the type of NV, whereby those commands not listed are not relevant for the lamp actuator.

Command	SNVT_switch	SNVT_setting
No command	(127.5, -1)	(SET_NUL, 127.5, 655.34)
Off/close	(0.0, 0)	(SET_OFF, 0.0, 0.00)
On/open	(100.0, 1)	(SET_ON, 100.0, 0.00)

If the NV type SNVT_scene is present, the scene entry called up must contain the corresponding value. The desired response can be specified in the object plug-in on the "Priority settings" in the section entitled "Return behaviour".

Return behaviour

These settings determine whether and which command is executed on returning to a priority.

Priority	Execute	Command
Automatic	Command	no command
Manual	nothing	no command
Override 1	last abs cmd	Off/Close
Weather	nothing	On/Open
Override 2	nothing	Up
		Slat up
		Down
		Slat down
		Stop

The reaction is set for each priority under "Execute" when the priority is restored. If required the command to be executed must also be selected.

Example In the example the last absolute command is executed on return to 'Automatic'. Therefore the switch-off delay for the light switch starts directly if the room is no longer occupied.

Step 6 – Response following power resumption and RESET

If required, the activity of individual priorities can also be maintained beyond a RESET. In such cases this also influences the response following a RESET. For each priority a non-volatile memory has been set, it will be evaluated after a RESET or power resumption, if the priority was active before it. In this case the priority will be reactivated. Is one of the these priorities the valid priority after the evaluation, a configured positioning calibration (channel configuration) or a configured treatment on RESET (object configuration) will not be executed. If there is no active priority present, the parameterized treatment is executed following power resumption / reset.

Example Saving beyond a reset is not required for our example.

If priorities are to be retained beyond a reset, this can be configured on the "Save priority" tab.

Save priorities "non-volatile"

Enter here the priorities which are to remain stored following a reset or power failure.

- ☐ Auto
- ☐ Manual
- ☐ Override 1
- ☐ Weather
- ☐ Override 2
- ☐ Safety

Use of groups

Group objects for controlling the lamp actuators can be used. These are located on the same device and provide a network variable as an interface to all its group members. The ability to operate all output objects via a group object too means that central commands can be set up in such a way that only one network variable has to be bound for each device. Therefore, no alias table entries are used on the transmitting device, which would be required for binding the actuator objects separately.

The assignment of actuator objects to group objects has to be done in the device plug-in, as described in the relevant section. Operation of the group controllers and their parametrization are described in the section on the group objects.

Switchable network variables

Various types of network variable can be used for the lamp actuator. In this way, the object can be adapted to the network interfaces available in the network.. For some functions the respective type of NV is relevant when setting the parameters, for example in the case of priority evaluation. The standard types listed may be used:

NV types	allowed for input variables	allowed for output variables
SNVT_setting	x	-
SNVT_switch	x	x
SNVT_scene	x	-

The NV type is set in the object plug-in - for input variables this is done on the "NVI settings" tab in the section entitled "Input network variable", and for output variables on the "NVO settings" tab in the section "Output network variables".

Network variable input _____

Network variable type ▼

Network variable output _____

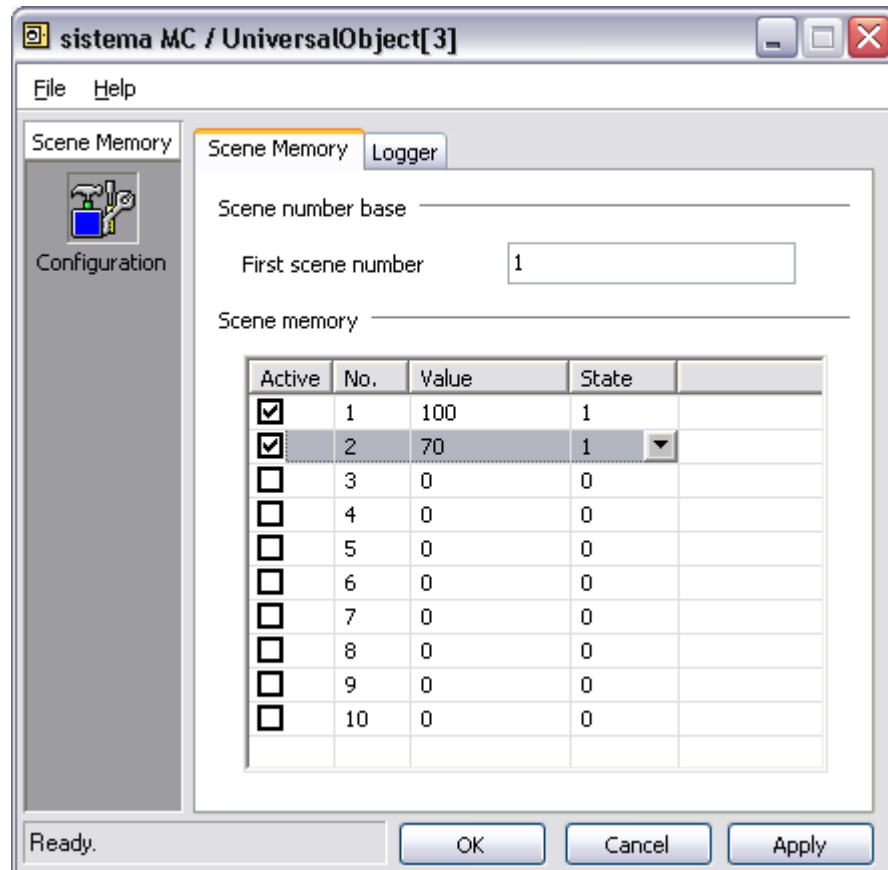
Network variable type ▼

Space usage selection (scene control)

A scene controller is available for the lamp actuator, allowing it to be activated via scenes. For this the network variable provided for activation purposes should set to 'SNVT_scene'. Telegrams on the input variable are processed as follows:

SNVT_scene	Meaning
SC_LEARN, x	Save output variable as a control value for scene x
SC_RECALL, x	Call up scene x

The scene plug-in for parameterizing the scene controller is run directly on the lamp actuator.



The scene controller contains a fixed number of entries, whereby the scene number of the first entry may be parameterized. All other entries have ascending numbers, as can be seen in column "No." Each entry to be used must first be activated in the column "Active". The scene entries are of type 'SNVT_switch' for the lamp actuator.

Action in the event of communication faults

Faulty input telegrams (see LonMark specifications) are ignored. In order to deal with communication faults and a related possible failure of individual activation sources, an input test can be set for each input network variable. For this the activation source must support cyclic transmission and its parameters be set accordingly. If no new network telegram is received within a parameterized time period, a previously defined command is executed. This may be used for activating or deactivating the relevant priority or may contain a specific lamp value.

It should be noted that this function cannot be used at the same time as automatic priority cancellation on the same input variable. Parametrization of the input test is performed for the input variable concerned in the object plug-in on the "NVI settings" tab in the section entitled "Heartbeat monitoring".

Heartbeat monitoring

☒ invalid after s

This value is executed on expiration of the period of validity.

Value

Value (RAW)

- switch on
- switch off
- invalid
- user defined

The input test is activated by selecting "invalid after" and entering the desired monitoring time. In addition, a value should be selected which is executed on expiry of the monitoring time, if no new telegram is received. You can choose between the values listed and the setting "User-defined".

Entry	SNVT_switch	SNVT_setting	Meaning
Switch-on	(100.0, 1)	(SET_ON, 100.0, 0.00)	System is switched on
Switch-off	(0.0, 0)	(SET_OFF, 0.0, 0.00)	System is switched off
Invalid	(127.5, -1)	(SET_NUL, 127.5, 655.34)	Priority is cancelled

When selecting "User-defined" the desired value must be given in raw data form according to the type of NV used.

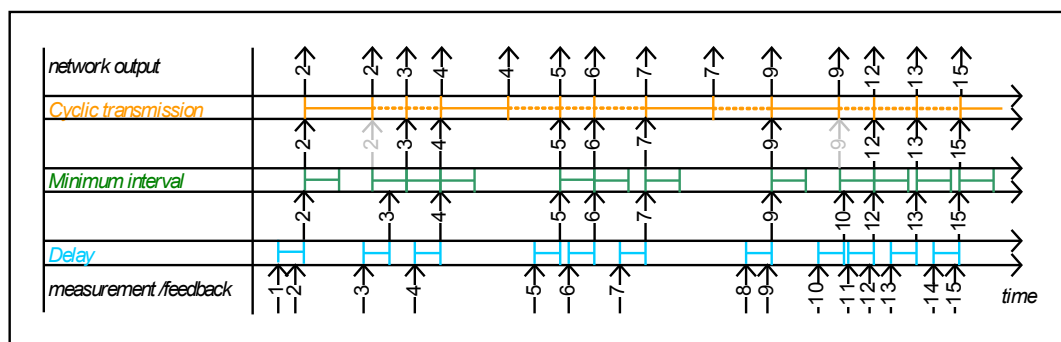
NV type	Raw format			
SNVT_switch	[.value]	[.state]	[-]	[-]
SNVT_setting	[.function]	[.setting]	[.rotation	]
SNVT_scene	[.function]	[.scene_nمبر]*	[-]	[-]

* The scene input called up must contain the desired value (see section on scene control)

An input test may also be configured for group input variables. For using the input test the corresponding network variable has to be bound.

Transmission response of output variables

The transmission response of the output network variable can be altered via transmission times. There are 3 various components available for defining the time-based transmission response.



Delay

Values which are intended to be output may be delayed.

Minimum interval

A minimum time interval may be defined for successive output telegrams, to ensure the receiver has enough time to process the telegrams.

Cyclic transmission (heartbeat)

To secure the connection to the receiver the output values may be transmitted cyclically, even without taking the minimum change into account. Note here that cyclic transmission increases the bus load.

The transmission times are set in the object plug-in on the "NVO settings" tab in the "Transmission interval" section.

Transmission interval for nvoUAValue _____

☒ Resend after	10	s
☒ Send no more than every	1	s
Delay sending by	2	s

Cyclic transmission is activated by selecting "Resend after"; the transmission rate can be specified. The minimum interval is activated by selecting "Send no more than every"; the interval can be parameterized. The delay function is activated using input values greater than 0 under "Delay sending by".

4.4.2 Sunblind actuator

The sunblind actuator is used to activate blinds, shades, awnings and windows and can be adapted as required by parameterizing the object functions.

Depending on the application version, the actuator object provides one or two network input network variables, which are used to activate the actuator. The use of group objects means that additional input variables are available for central functions. In addition, each object sends back the current position of the actuator on its output network variable.

Overview of object functions

Extended functions are supported in addition to the VDI 3813-compliant room automation functions.

VDI3813 – Functions

- Sunblind actuator
- Space usage selection
- Actuator
- Priority evaluation

Extended function

- Switchable network variable types
- Output network variable transmission response
- Action in the event of communication faults
- Action following resumption of power supply/reset
- Activation via groups

Parametrization of object functions

The objects are parameterized using the corresponding object plug-ins. These can be started directly on the object from the device plug-in or in the LNS tool.

Action following resumption of power supply or reset

The response following the resumption of a power supply or RESET can be parameterized. A position can be specified here. There is also the possibility of not executing a command. Parametrization is carried out in the object plug-in on the "General" tab.

On voltage recovery or reset _____

☒ Do nothing

☐ Move to top end position

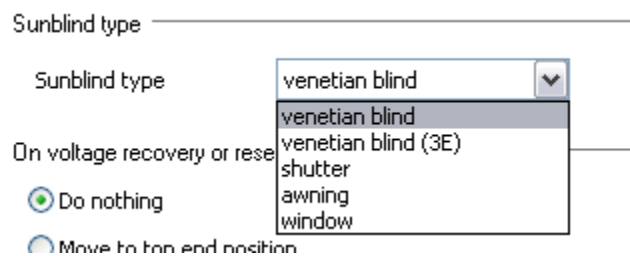
☐ Move to bottom end position

☐ Move into position % °

Depending on the hardware activated, definition of the position of the actuator can be deactivated until the actuator has been moved into one of its end positions. Some actuator modules also feature automatic calibration. More detailed information on this is given in the relevant module section. If the position cannot be determined correctly, the output network variable will send back an invalid value.

Types of actuator

The actuator object can activate blinds (with 2 or 3 end positions), shades, awnings and windows. You must first specify for each object which type of blind is to be activated. This is set in the object plug-in on the "General" tab in the "Blind type" section.



In addition to priority evaluation and space usage selection, the blind types support the following object functions in compliance with VDI 3813:

Blind type	Sunblind actuator	Actuator
Shade	x	-
Awning	x	-
Window	-	x
Blind	x	-
Blind, 3 end positions	x	-

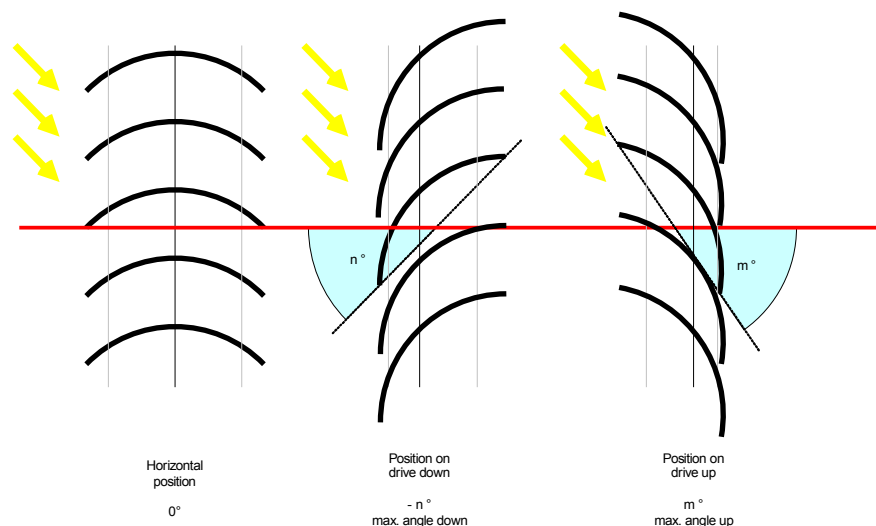
Sunblind actuator

The behaviour of the actuator depends on the type of blind specified. The following table lists the availability of the sub-functions described below for the individual types of blind.

Blind type	Slat angle adjustment	Behaviour on change in direction of travel	Travel to 3 rd end position
Shade	-	x	-
Awning	-	x	-
Blind	x	x	-
Blind, 3 end positions	x	x	x

Slat angle adjustment

The end angles (see figure) of the actuators are required to enable a slat angle adjustment. The slats can be adjusted within the range specified by them. In the case of sunblinds with 3 end positions, an angle for the fully closed position is required; this is used for the 3rd end position.



Parametrization of the end angles is carried out in the object plug-in on the "Slat settings" tab.

Slat settings

Please enter here the maximum slat angle of the blind to be controlled. Please note that angles "up" should be entered as positive and angles "down" as negative angles.

Max angle up

 °

Max angle down

 °

The slat angle for the fully closed position of blinds with 3 end positions should be entered on the "3rd end position" tab in the section entitled "Slat angle in closed position (3rd end position)".

Slat angle in closed position (3rd end position)

Please enter here the slat angle, which should be shown via the feedback message once the sunblind is in the closed position.

Slat angle

 °

General processing of movement commands

The movement commands listed below can be processed by the sunblind actuator. Angle movement or angle positioning commands, however, are only executed if a blind type with slat angle adjustment is present.

SNVT_setting	Blind position	Slat angle
(SET_UP, 0.0, 0.00) (SET_UP, 100.0, 0.00)	Raise fully	-
(SET_UP, 0.0, y)	-	Turn slats upwards by angle y
(SET_UP, 0 < x < 100.0, 0.00)	Raise by length x	-

SNVT_setting	Blind position	Slat angle
(SET_DOWN, 0.0, 0.00) (SET_DOWN, 100.0, 0.00)	Lower fully	Slat angle in the lower shading position
(SET_DOWN, 0.0, y)	-	Turn slats downwards by angle y
(SET_DOWN, 0 < x < 100.0, 0.00)	Lower by length x	-
(SET_STOP, 0.0, 0.00)	Stop	-
(SET_STATE, x, y)	Absolute movement to specified position x	Absolute movement to specified angle y

The current position of the actuator is read out as a feedback message. If the blind is currently moving, the direction of travel can be identified from the feedback message. The position is updated as soon as the blind has reached its target position.

The slat angle in the lower shading position can be set for blind types with slat adjustment in the object plug-in on the "Movement behaviour" in the "Slat adjustment in the lower shading position" section.

Slat angle for lower shading position _____

Please enter here the slat angle, which has to be set after a travel to lower end position (SET_DOWN 100.0%).

Slat angle

°

Behaviour on change in direction of travel

The behaviour of movement commands received during a travel motion and requiring a change of direction can be parameterized separately for each priority. With automatic commands or safety-related movement commands, a direct change of direction, for example, is expected; when using buttons for manual operation, however, it is useful if the blind is stopped first if a command to move in the opposite direction is given. No additional button for stopping the blind is therefore required.

The behaviour in the event of a change in the direction of travel can be configured in the object plug-in on the "Movement behaviour" tab in the section entitled "Behaviour with commands for travel in opposite direction". Here you can select for each priority whether travel should be stopped (check box) or not.

Response on commands for travel in opposite direction

If a relative movement command ("SET_UP" or "SET_DOWN") on the selected priorities is received during travel, the blind is stopped. The received movement command on the other priorities is executed instead.

- ☐ Auto
- ☒ Manual
- ☒ Override 1
- ☐ Weather
- ☐ Override 2
- ☐ Safety

Travel to 3rd end position

To simplify manual operation of 3 end positions using buttons, the 3rd end position can be executed via a rapid sequence of 2 "down" commands. The maximum time gap allowed between commands may be parameterized. The time gap may be set in the object plug-in on the "3rd end position" tab in the "Travel to closed position (3rd end position)" section. A gap of 0 seconds deactivates the check for 2 successive telegrams.

Travel to closed position (3rd end position)

The sunblind moves into the closed position if two "down" commands ("SET_DOWN") are received within this time period.

Time interval s

Actuator

The "window" blind type is considered an actuator. The actuator receives movement commands via the input from a higher-level control unit. The current position is read out as feedback via the output variable.

General processing of movement commands

The movement commands listed below can be processed.

SNVT_setting	Window position
(SET_UP, 0.0, 0.00) (SET_UP, 100.0, 0.00)	Close fully
(SET_UP, 0 < x < 100.0, 0.00)	Close by x %
(SET_DOWN, 0.0, 0.00) (SET_DOWN, 100.0, 0.00)	Open fully
(SET_DOWN, 0 < x < 100.0, 0.00)	Open by x %
(SET_STOP, 0.0, 0.00)	Stop
(SET_STATE, x, y)	Absolute movement to specified position x

The current position of the window is read out as a feedback message. If the window is currently moving, the direction of travel can be identified from the feedback message. The position is updated as soon as the window has reached its target position. For windows the system has also been configured such that - when in the closed position - the output to close the window is no longer activated. This prevents windows from jamming if there are no end position switches present to disable the motor automatically.

Behaviour on change in direction of travel

The behaviour of movement commands received during a travel motion and requiring a change of direction can be parameterized separately for each priority. With automatic commands or safety-related movement commands, a direct change of direction, for example, is expected; when using buttons for manual operation, however, it is useful if the blind is stopped first if a command to move in the opposite direction is given. No additional button for stopping the window is therefore required.

The behaviour in the event of a change in the direction of travel can be configured in the object plug-in on the "Movement behaviour" tab in the section entitled "Response on commands for travel in opposite direction". Here you can select for each priority whether travel should be stopped (check box) or not.

Response on commands for travel in opposite direction —————

If a relative movement command ("SET_UP" or "SET_DOWN") on the selected priorities is received during travel, the blind is stopped. The received movement command on the other priorities is executed instead.

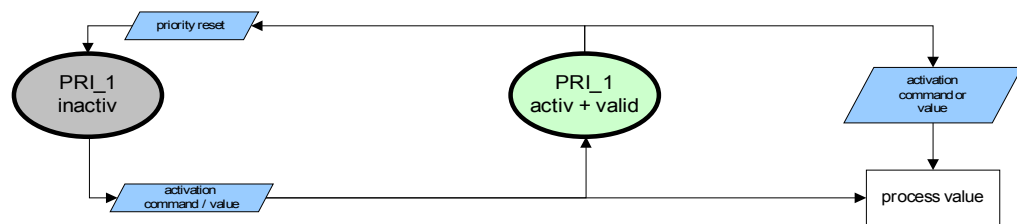
- ☐ Auto
- ☒ Manual
- ☒ Override 1
- ☐ Weather
- ☐ Override 2
- ☐ Safety

Priority evaluation

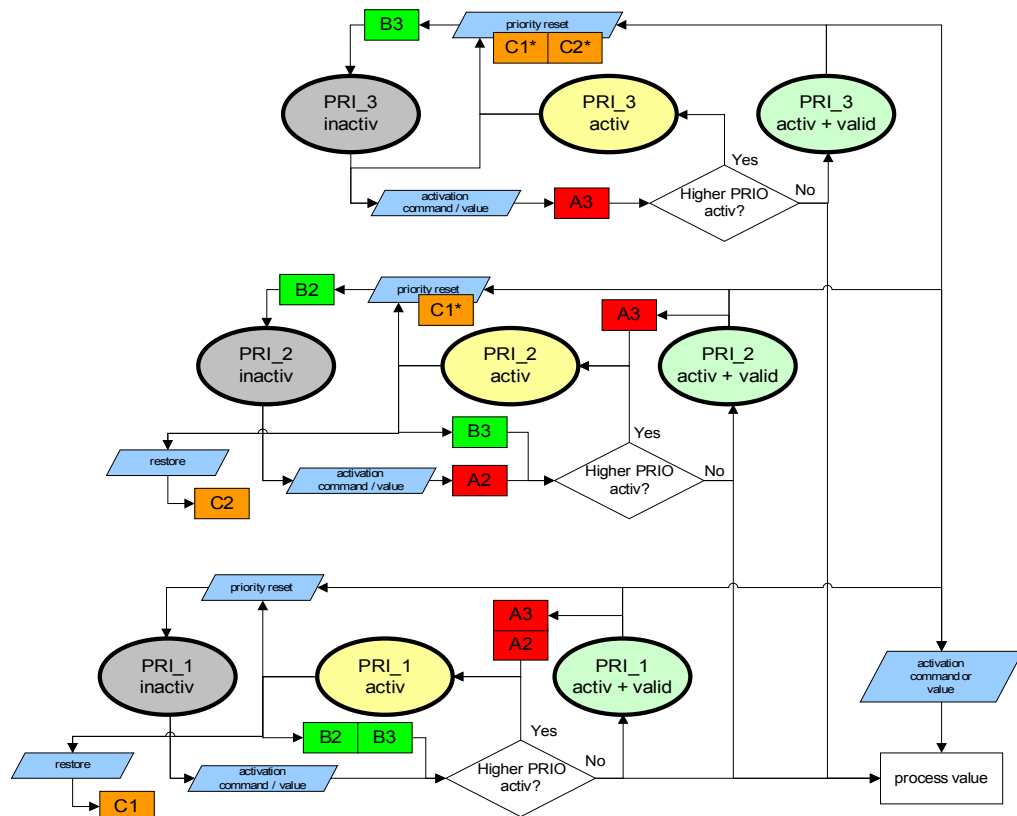
The object is activated via the input network variables. By setting priorities various input variables can be sorted according to their importance. In this way mutual interference caused by activation from more than one source can be avoided. Priority evaluation is parameterized via the object plug-in. If group objects are used as control sources, parts of the priority evaluation must also be set here in the relevant object plug-in.

Principle of operation

Each priority has two initial states. Either valid activation values are received, in which case the priority is considered active, or the activity is explicitly retracted, whereby an 'invalid' value is sent.



In the case of a single priority the status diagram shown above applies. As soon as other priorities are added they must be mutually interlocked.



As a result each priority is given a further status. It may now be active, however its values may not be executed due to a higher-weighted priority. It loses its validity as soon as a higher priority is activated (Ax events). On the other hand, a priority may regain its validity as soon as the last higher priority is retracted (Bx events) or it replaces higher priorities itself (Cx events). In cases where a priority becomes valid again because a higher priority has been retracted, it is possible to stipulate for the re-validated priority how it should handle this event.

Parametrization

A full overview of the room and central functions in which the sunblind actuator is involved is vital for setting the priority evaluation parameters. For this reason the configuration stages are described using an example.

Example Sun tracking control and manual operation, window cleaning and sunblind protection control functions are to be installed in all rooms in an office building. With the sunblind protection control function active (e.g. during storms or icy conditions) the blinds should move to a secure position and no commands should be executed until the protection control mode has been cancelled. With the window cleaning mode active, the blind control system should not execute any positioning commands for sun tracking control or manual operation. Manual operation cannot be overwritten by sun tracking control. However, if the sunblind control function has not been manually operated for a specific length of time, commands for sun tracking control should be executed again.

Step 1 – Selection of input variables

1 or 2 input network variables are available on the object, depending on the application. Group objects may also be used for other input variables. The inputs on the object are best suited for local functions and groups are suitable for central functions.

Example In our example we have manual operation as a local function as well as 3 central functions, whereby the function in the case of sun tracking control is usually one which applies to the whole of the façade. The sunblind protection control function can be a façade-wide or building-wide function. The input variable on the sunblind actuator should therefore be used for manual control, whereas group objects are suitable for other functions.

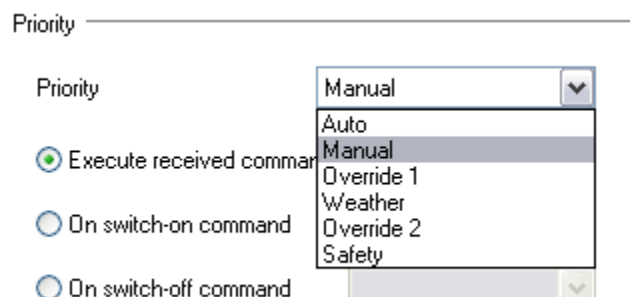
Step 2 – Selection of priorities

Here you must first consider which priorities are suitable for implementing the functions. In total there are 6 different priorities available with the following weighting:

Automatic < Manual < Override 1 < Weather < Override 2 < Safety

Example In our example the 'Automatic' priority is suitable for sun tracking control and 'Manual' for manual operation. The window cleaning mode, on the other hand, should be selected one priority higher, i.e. to Override 1. The next higher priority 'Weather' can then be used for sunblind protection control.

The priority is set on the respective input network variable used, this also affects activation via groups (see section on groups). The priority can be set in the object plug-in on the tab of the corresponding input variable in the section entitled "Priority".



Step 3 – Defining the type of activation

There are 3 types of activation for each input network variable. This determines how the commands received are processed.

Setting	Meaning
Execute received command	Each telegram on the input variable is set directly as a new light value.
On switch-on command	If a switch-on command is received, the command specified is executed. A switch-off command causes the priority to be retracted.
On switch-off command	If a switch-off command is received, the command specified is executed. A switch-on command causes the priority to be retracted.

The "On switch-on command" and "On switch-off command" types of activation use the following switch-on and switch-off commands, depending on the type of network variable used:

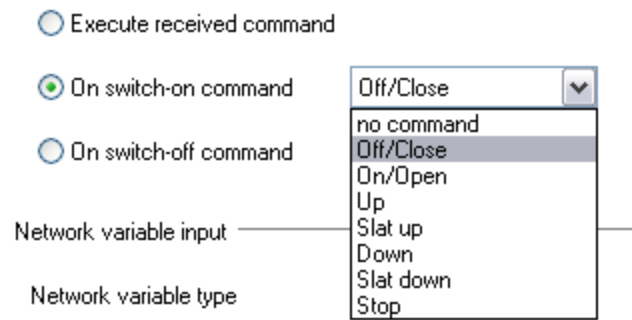
NV type	Switch-on command	Switch-off command
SNVT_switch	(100.0,1)	(0.0,0)
SNVT_setting	(SET_ON,100.0,0.00)	(SET_OFF,0.0,0.00)

On activating the priority, a series of different commands can be selected for the "On switch-on command" and "On switch-off command" types of activation, whereby those commands not listed are not relevant for the damper actuator.

Command	Meaning
No command	The priority is activated, however no command is executed
Raise	Raise sunblind / close window
Turn up 10°	Turn slats up 10° (sunblind with slat adjustment)
Lower	Lower sunblind / open window
Turn down 10°	Turn slats down 10° (sunblind with slat adjustment)
Stop	Stop active movements

Example *In our example we are using the "Execute received command" type of activation for both sun tracking control and manual operation. This allows us to stipulate that the object is activated with direct movement commands. Only simple sources which are able to send only information on whether the function should be active or not - and not direct movement commands - should be available for window cleaning and sunblind protection modes. For this reason, we will use the "On switch-on command" type of activation for both. "Raise" is input as the command in both cases.*

The type of activation is defined separately for each input network variable; this also relates to groups (see section on groups). It is set in the object plug-in on the tab of the corresponding input variable in the section entitled "Priority".



Step 4 – How is the activity of the priorities reset?

Priorities are usually reset via direct telegrams; here the corresponding invalid value should be sent, depending on the type of NV set. With the "On switch-on command" type of activation, switching-off causes the priority to be reset. The same applies when switching on using the "On switch-off command" type of activation. The invalid values for various types of NV are shown in the table:

NV type	Invalid value
SNVT_switch	(x, -1) any values are possible for x
SNVT_setting	(SET_NUL, x, y) any values are possible for x and y
SNVT_scene	The scene input called up must contain an invalid value (see section on scene control)

Example In this example no cancellation is required for sun tracking control, as this is already the lowest priority value. Switching off resets the window cleaning and sunblind protection control modes directly. However we cannot cancel manual operation by standard means, therefore another solution is required.

If an activation source is not able to trigger a cancellation directly from an invalid value (e.g. manual operation), there are 2 mechanisms available for switching the priority off again. Both alternatives are also available when using groups.

Alternative 1 – Automatic priority cancellation

First of all, a period of validity can be specified on the corresponding input network variable. If the specified time elapses without new, valid control output values being received, this event is treated as though an invalid value for cancellation had been received. This invalid value must therefore be explicitly specified below the relevant input network variable. For using the automatic priority cancellation the corresponding network variable has to be bound.

Example This is the most suitable alternative for resetting manual operation. In this way we can stipulate how long manual operation (override) remains valid.

Automatic priority cancellation is set in the object plug-in on the "NVI settings" tab in the section entitled "Heartbeat monitoring". It should be noted that this function cannot be used at the same time as the treatment of communications faults on the same input variable.

Heartbeat monitoring

☒ invalid after s

This value is executed on expiration of the period of validity.

Value

Value (R/W)

Automatic priority cancellation is activated by selecting "invalid after" and entering the desired period of validity. "Invalid" should be selected as a value in order to ensure cancellation of the priority on expiry of the period of validity.

Alternative 2 – Priority Restore

The second mechanism allows an active though invalid priority to try to restore its validity by deactivating higher priorities by means of a special command.

Example In our example no priority restoration is required.

The restore mechanism applies across all objects for all network inputs with the same priority (even if on a group) and is configured in the object plug-in on the "Priority settings" tab in the section entitled "Restore behaviour".

Restore behaviour

These settings determine which of the selected higher priorities are reset when the selected command is sent on a network variable with the desired "NV priority".

NV priority	M	O1	W	O2	S	Command
Automatic	☒	☐	☐	☐	☐	No command
Manual	☐	☐	☐	☐	☐	No command
Override 1	☐	☐	☐	☐	☐	Off/Close
Weather	☐	☐	☐	☐	☐	On/Open
Override 2	☐	☐	☐	☐	☐	Up
						Slat up
						Down
						Slat down
						Stop

For each of the possible priorities you must first enter which of the higher priorities it can reset. If at least one priority is selected, the command must also be given as to which priority should initiate the reset. If this command is then received on the desired low priority, active priorities which are marked as resettable are reset. A priority reset can only be successfully implemented if no higher priorities are active after it. It should be noted that the return behaviour described below does not apply after a priority restoration.

Step 5 – Defining the return behaviour

The return behaviour describes what happens for each priority when it is reactivated because one/all higher priorities has/have been cancelled. You can choose between 3 different reactions for this object-wide setting:

Reaction	Description
None	The system waits until a new operating command is received which is then set normally.
Last abs. command	The last operating command received (absolute) is executed. Operating commands which were received when the priority was still active but invalid are also taken into account here.
Command	A specific command is executed

It should be noted that the response following a reset (see previous section) cannot be specified, it always corresponds to the reaction "none". To execute a specific command it is possible to choose between the commands listed, depending on the type of NV, whereby those commands not listed are not relevant for the sunblind actuator.

Command	SNVT_switch	SNVT_setting	SNVT_scene
No command	(127.5, -1)	(SET_NUL, 127.5, 655.34)	The scene input called up must contain the desired value (see section on scene control)
Off/close	(0.0, 0)	(SET_OFF, 0.0, 0.00)	
On/open	(100.0, 1)	(SET_ON, 100.0, 0.00)	
Raise	(100.0, 3)	(SET_UP, 100.0, 0.00)	
Turn up 10°	-	(SET_UP, 0.0, 10.00)	
Lower	(100.0, 2)	(SET_DOWN, 100.0, 0.00)	
Turn down 10°	-	(SET_DOWN, 0.0, 10.00)	
Stop	(0.0, 4)	(SET_STOP, 0.0, 0.00)	

The desired response can be specified in the object plug-in on the "Priority settings" in the section entitled "Return behaviour".

Return behaviour

These settings determine whether and which command is executed on returning to a priority.

Priority	Execute	Command
Automatic	Command	no command
Manual	nothing	no command
Override 1	last abs cmd	Off/Close
Weather	nothing	On/Open
Override 2	nothing	Up
		Slat up
		Down
		Slat down
		Stop

The reaction is set for each priority under "Execute" when the priority is restored. If required the command to be executed must also be selected.

Example In the example the last absolute command is executed on return to 'Automatic'. A return to window cleaning mode should not bring about any reaction, therefore we enter "nothing" under "Execute".

Step 6 – Response following power resumption and RESET

If required, the activity of individual priorities can also be maintained beyond a RESET. In such cases this also influences the response following a RESET. For each priority a non-volatile memory has been set, it will be evaluated after a RESET or power resumption, if the priority was active before it. In this case the priority will be reactivated. Is one of the these priorities the valid priority after the evaluation, a configured positioning calibration (channel configuration) or a configured treatment on RESET (object configuration) will not be executed for remaining the position. If there is no active priority present, the parameterized treatment is executed following power resumption / reset.

Example In our example it makes sense to save beyond a RESET for the sunblind protection control function. Activation should generally take place in cycles here, thereby ensuring that the sunblind protection control function remains in place after a RESET and the priority is only cancelled when a switch-off command is given.

If priorities are to be retained beyond a reset, this can be configured on the "Save priority" tab.

Save priorities "non-volatile" _____

Enter here the priorities which are to remain stored following a reset or power failure.

☐ Auto

☐ Manual

☐ Override 1

☐ Weather

☐ Override 2

☐ Safety

Use of groups

Group objects for controlling the sunblind actuators can be used. These are located on the same device and provide a network variable as an interface to all its group members. The ability to operate all output objects via a group object too means that central commands can be set up in such a way that only one network variable has to be bound for each device. Therefore, no alias table entries are used on the transmitting device, which would be required for binding the actuator objects separately.

The assignment of actuator objects to group objects has to be done in the device plug-in, as described in the relevant section. Operation of the group controllers and their parametrization are described in the section on the group objects.

Switchable network variables

Various types of network variable can be used for the sunblind actuator. In this way, the object can be adapted to the network interfaces available in the network.. For some functions the respective type of NV is relevant when setting the parameters, for example in the case of priority evaluation. The standard types listed may be used:

NV types	allowed for input variables	allowed for output variables
SNVT_setting	x	x
SNVT_switch	x*	-
SNVT_scene	x	-

* not for direct movement commands

The NV type is set in the object plug-in - for input variables this is done on the "NVI settings" tab in the section entitled "Input network variable", and for output variables on the "NVO settings" tab in the section "Output network variables".

Network variable input _____

Network variable type

Network variable output _____

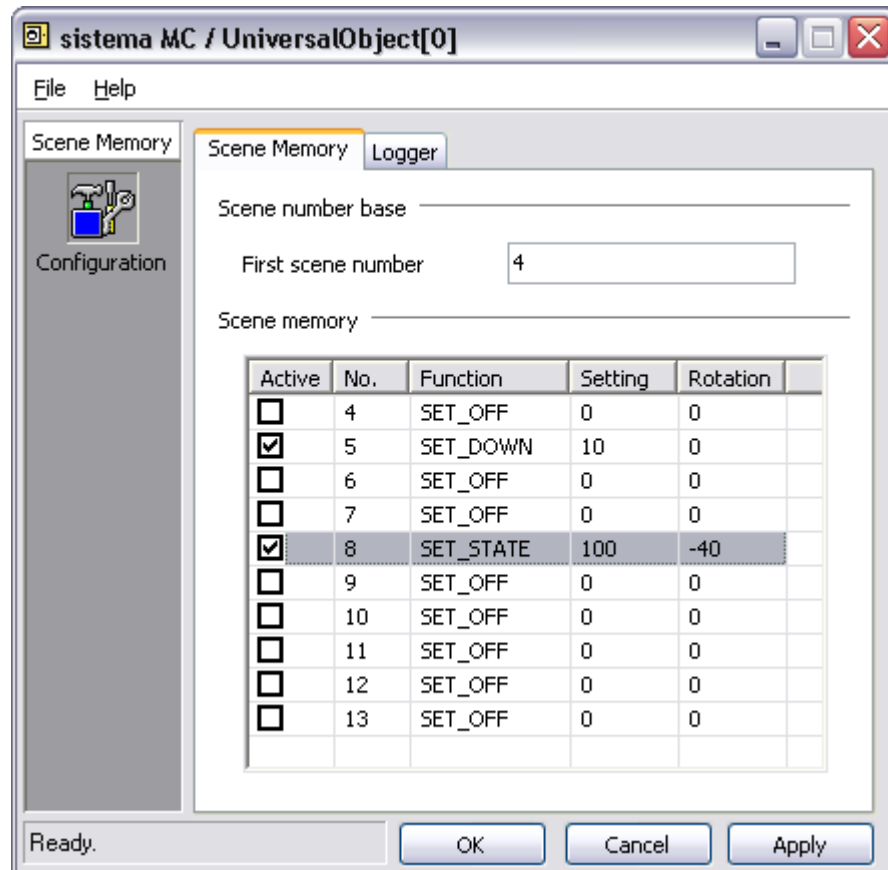
Network variable type

Space usage selection (scene control)

A scene controller is available for the damper actuator, allowing it to be activated via scenes. For this the network variable provided for activation purposes should set to 'SNVT_scene'. Telegrams on the input variable are processed as follows:

SNVT_scene	Meaning
SC_LEARN, x	Save output variable as a control value for scene x
SC_RECALL, x	Call up scene x

The scene plug-in for parameterizing the scene controller is run directly on the sunblind actuator.



The scene controller contains a fixed number of entries, whereby the scene number of the first entry may be parameterized. All other entries have ascending numbers, as can be seen in column "No." Each entry to be used must first be activated in the column "Active". The scene entries are of type 'SNVT_setting' for the sunblind actuator.

Action in the event of communication faults

Faulty input telegrams (see LonMark specifications) are ignored. In order to deal with communication faults and a related possible failure of individual activation sources, an input test can be set for each input network variable. For this the activation source must support cyclic transmission and its parameters be set accordingly. If no new network telegram is received within a parameterized time period, a previously defined command is executed. This may be used for activating or deactivating the relevant priority or may contain a movement command.

It should be noted that this function cannot be used at the same time as automatic priority cancellation on the same input variable. Parametrization of the input test is performed for the input variable concerned in the object plug-in on the "NVI settings" tab in the section entitled "Heartbeat monitoring".

Heartbeat monitoring

☒ invalid after s

This value is executed on expiration of the period of validity.

Value

Value (RAW)

- switch on
- switch off
- invalid
- user defined

The input test is activated by selecting "invalid after" and entering the desired monitoring time. In addition, a value should be selected which is executed on expiry of the monitoring time, if no new telegram is received. You can choose between the values listed and the setting "User-defined".

Entry	SNVT_switch	SNVT_setting	Meaning
Switch-on	(100.0, 1)	(SET_ON, 100.0, 0.00)	System is switched on
Switch-off	(0.0, 0)	(SET_OFF, 0.0, 0.00)	System is switched off
Invalid	(127.5, -1)	(SET_NUL, 127.5, 655.34)	Priority is cancelled
Upper end position	-	(SET_UP, 100.0, 0.00)	Raise fully (on Close windows)
Lower end position	-	(SET_DOWN, 100.0, 0.00)	Lower fully (on Open windows)

Depending on the entry, the respective control output value is used:

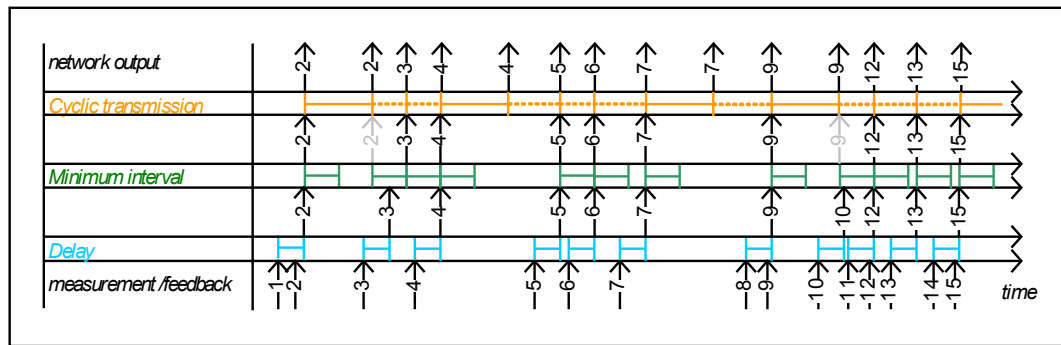
NV type	Raw format			
SNVT_switch	[.value]	[.state]	[-]	[-]
SNVT_setting	[.function]	[.setting]	[.rotation	]
SNVT_scene	[.function]	[.scene_nmbr]*	[-]	[-]

* The scene input called up must contain the desired value (see section on scene control)

An input test may also be configured for group input variables. For using the input test the corresponding network variable has to be bound.

Transmission response of output variables

The transmission response of the output network variable can be altered via transmission times. There are 3 various components available for defining the time-based transmission response.



Delay

Values which are intended to be output may be delayed.

Minimum interval

A minimum time interval may be defined for successive output telegrams, to ensure the receiver has enough time to process the telegrams.

Cyclic transmission (heartbeat)

To secure the connection to the receiver the output values may be transmitted cyclically, even without taking the minimum change into account. Note here that cyclic transmission increases the bus load.

The transmission times are set in the object plug-in on the "NVO settings" tab in the "Transmission interval" section.

Transmission interval for nvoUAValue _____

☐ Resend after s

☐ Send no more than every s

Delay sending by s

Cyclic transmission is activated by selecting "Resend every"; the transmission rate can be specified. The minimum interval is activated by selecting "Don't send oftener than every"; the interval can be parameterized. The delay function is activated using input values greater than 0 under "Send delayed with".

4.4.3 Damper actuator

The damper actuator is used to activate various types of drives in HVAC technology and can be adapted as required by parameterizing the object functions. Depending on the application version, the actuator object provides one or two network input variables, which are used to activate the actuator. The use of group objects means that additional input variables are available for central functions. In addition, each object sends back the current position of the actuator on its output network variable.

Overview of object functions

Extended functions are supported in addition to the VDI 3813-compliant room automation functions.

VDI3813 – Functions

- Actuator
- Space usage selection
- Priority evaluation

Extended function

- Switchable network variable types
- Output network variable transmission response
- Action in the event of communication faults
- Action following resumption of power supply/reset
- Activation via groups
- Valve rinsing
- Pulse width modulation

Parametrization of object functions

The objects are parameterized using the corresponding object plug-ins. These can be started directly on the object from the device plug-in or in the LNS tool.

Action following resumption of power supply or reset

The response following the resumption of a power supply or RESET can be parameterized. A position can be specified here. There is also the possibility of not executing a command. Parametrization is carried out in the object plug-in on the "General" tab.

On voltage recovery or reset _____

☒ Do nothing

☐ Set position %

Depending on the hardware activated, definition of the position of the actuator can be deactivated until the actuator has been moved into one of its end positions. Some actuator modules also feature automatic calibration. More detailed information on this is given in

the relevant module section. If the position cannot be determined correctly, the output network variable will send back an invalid value.

Types of drive

Since some functions depend on the type of drive activated, all drive types supported are listed below:

Type of drive		PWM	Valve rinsing
<i>Thermoelectric and motorized actuators</i>	Valve (2-point)	x	x
	Valve (3-point)	-	x
	Fan (on/off, 2-stage, 3-stage)	-	-
<i>Actuators with continuous control</i>	Valve (constant)	-	x
	Valve (6-way)	-	x

Actuator

The actuator receives control output values via the input from a higher-level control unit. The current control output value is read out as a feedback message via the output network variable.

General processing of control output values

The following control output values can be processed for the actuators.

Control output value	Valve (2-point, 3-point, constant)	Valve (6-way)	Fan (on/off, 2-stage, 3-stage)
0 %	Close	Close	Switch off fan
$0 \% < x \leq 100 \%$	Open at x %	Open sequence 2 at x %	Stage for x% based on threshold values
$-100 \% \leq x < 0 \%$	-	Open sequence 1 at - x%	-

When using fans the control output value is interpreted by means of the actuator's stage threshold values parameterized on the channel.

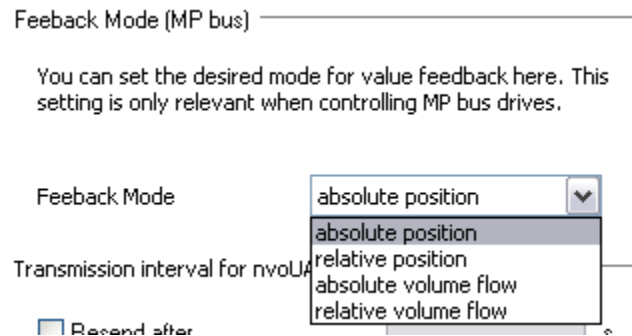
Feedback values

With valves the current position of the valve is output as a feedback signal; with fans the threshold value of the current stage is output. It is possible to define which information is sent back for the feedback signal, particularly in the case of actuators which are activated via the MP bus. You can choose from the following information:

Feedback mode	Meaning
Absolute position	The feedback contains the current position of the actuator as a percentage share of the measurable control output value range.
Relative position	The feedback contains the current position of the actuator as a percentage share of the control output value range parameterized in the MP actuator.
Absolute volume flow	The feedback contains the current volume flow of the actuator as a percentage share of the maximum measurable volume flow.

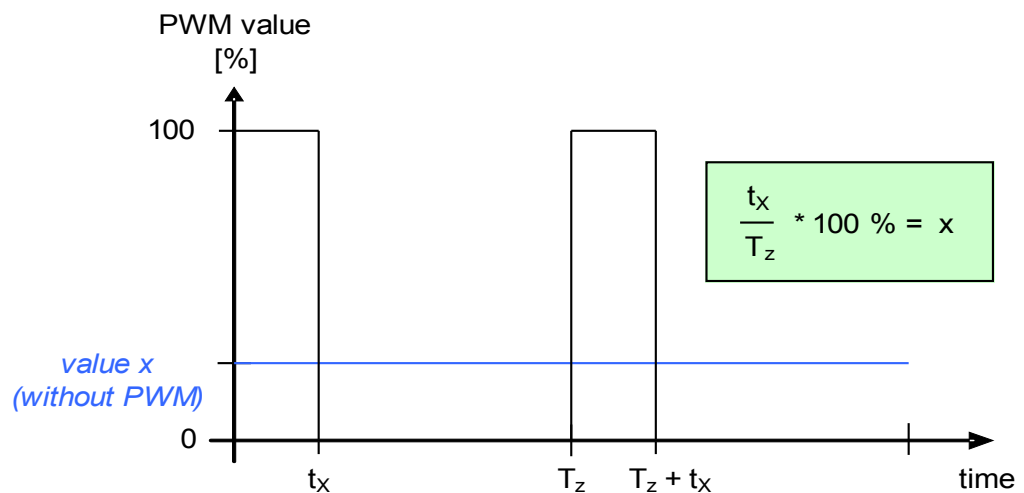
Relative volume flow	The feedback contains the current volume flow of the actuator as a percentage share of the maximum volume flow parameterized in the MP actuator.
----------------------	--

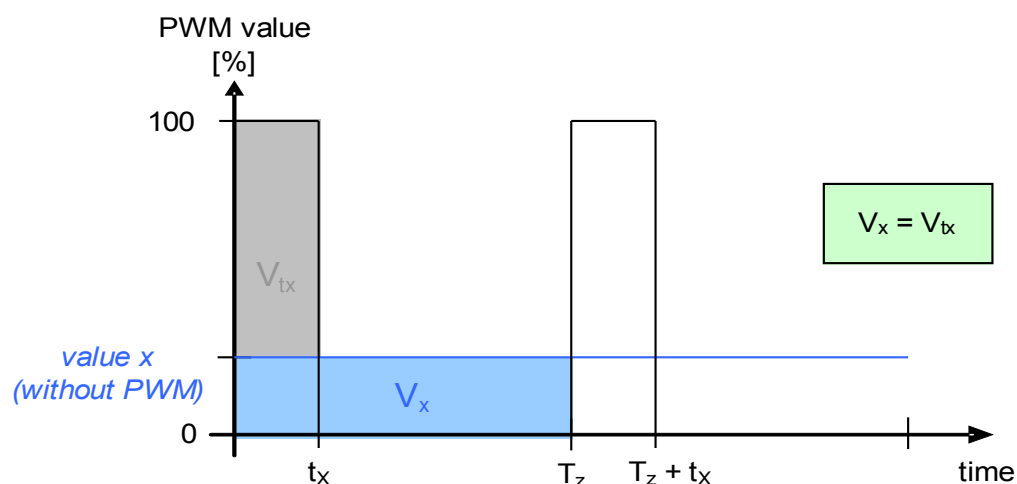
It can be set in the object plug-in on the "NVO settings" tab in the "Feedback mode (MP bus)" section.



Pulse width modulation

It may be advisable to modify the control output value, depending on the actuator connected and the control principle used. For example, a constant control output value may affect a thermoelectric actuator via pulse width modulation in such a way that the averaged flow rate is proportional to the control output value.





The pulse width modulation is characterized by the cycle duration T_z . Various cycle times are recommended, depending on the heating system:

Heating/cooling system	Cycle time
Radiator heating	15 min.
Underfloor heating	20 – 30 min.
Electric convection heating	15 min.
Chilled ceiling	15-20 min.

Configuration of the pulse width modulation by specifying the cycle time takes place in the object plug-in on the "PWM" tab.

Pulse width modulation (PWM)

You can set the cycle time for the pulse width modulation here. This setting is only effective on 2-point drives.

Cycle time s

Valve rinsing

To prevent valve stems or flaps from jamming, rinsing takes place automatically after a pre-defined time period, if the actuator was in the initial position throughout this period. The control output is opened fully for the duration of rinsing (upper output limit), then closed again; any parameterized pulse width modulation is ignored here.

Valve maintenance

If the valve has not been opened for the set time period, valve servicing (opening to protect against jamming) is carried out. Note: the valve flush duration is defined in the channel.

☒ Initiate servicing after days

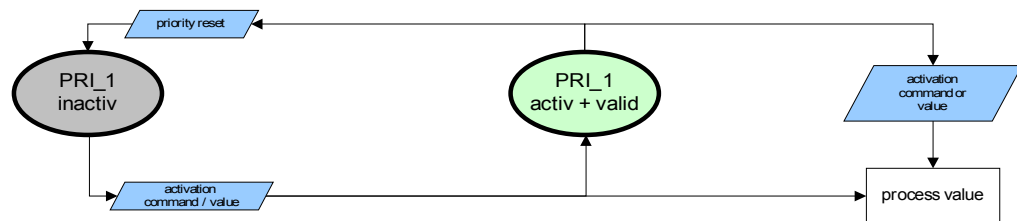
The maintenance function can be activated in the object plug-in on the "Maintenance" tab. The rinsing time is also defined here. The duration of a rinse is based on the information given at channel level for the drive concerned.

Priority evaluation

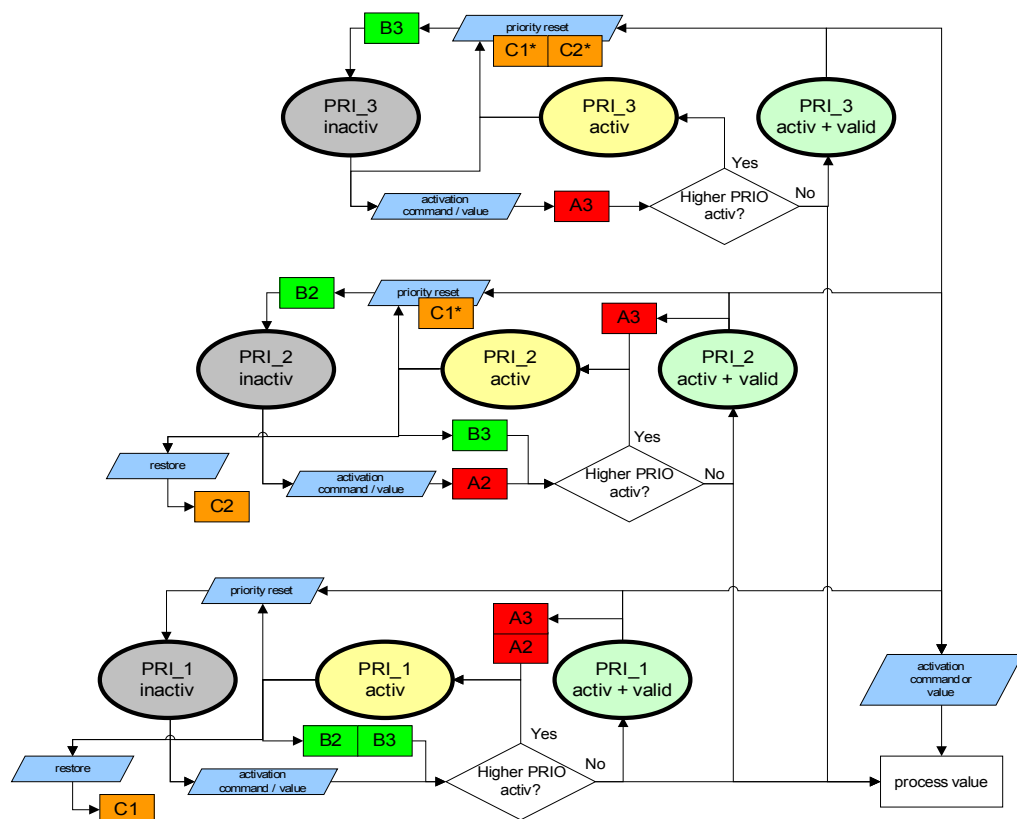
The object is activated via the input network variables. By setting priorities various input variables can be sorted according to their importance. In this way mutual interference caused by activation from more than one source can be avoided. Priority evaluation is parameterized via the object plug-in. If group objects are used as control sources, parts of the priority evaluation must also be set here in the relevant object plug-in.

Principle of operation

Each priority has two initial states. Either valid activation values are received, in which case the priority is considered active, or the activity is explicitly retracted, whereby an 'invalid' value is sent.



In the case of a single priority the status diagram shown above applies. As soon as other priorities are added they must be mutually interlocked.



As a result each priority is given a further status. It may now be active, however its values may not be executed due to a higher-weighted priority. It loses its validity as soon as a higher priority is activated (Ax events). On the other hand, a priority may regain its validity as soon as the last higher priority is retracted (Bx events) or it replaces higher priorities itself (Cx events). In cases where a priority becomes valid

again because a higher priority has been retracted, it is possible to stipulate for the re-validated priority how it should handle this event.

Parametrization

A full overview of the room and central functions in which the damper actuator is involved is vital for setting the priority evaluation parameters. For this reason the configuration stages are described using an example.

Example A room climate controller for activating a fan is being used in an office. A centralized fan override is provided, whereby only the Maximum speed and Off statuses should be possible.

Step 1 – Selection of input variables

1 or 2 input network variables are available on the object, depending on the application. Group objects may also be used for other input variables. The inputs on the object are best suited for local functions and groups are suitable for central functions.

Example In our example we have the control system as a local function and a central function. One input variable on the damper actuator should be used for activation via the room climate controller. A group object is required for central override purposes.

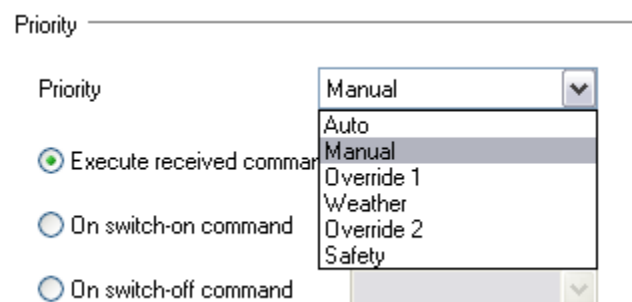
Step 2 – Selection of priorities

Here you must first consider which priorities are suitable for implementing the functions. In total there are 6 different priorities available with the following weighting:

Automatic < Manual < Override 1 < Weather < Override 2 < Safety

Example In our example the Automatic priority is suitable for activation via the room climate controller. At least one higher priority should be selected for central override. We select 'Manual'.

The priority is set on the respective input network variable used, this also affects activation via groups (see section on groups). The priority can be set in the object plug-in on the tab of the corresponding input variable in the section entitled "Priority".



Step 3 – Defining the type of activation

There are 3 types of activation for each input network variable. This determines how the commands received are processed.

Setting	Meaning
Execute received command	Each telegram on the input variable is set directly as a new light value.
On switch-on command	If a switch-on command is received, the command specified is executed. A switch-off command causes the priority to be retracted.
On switch-off command	If a switch-off command is received, the command specified is executed. A switch-on command causes the priority to be retracted.

The "On switch-on command" and "On switch-off command" types of activation use the following switch-on and switch-off commands, depending on the type of network variable used:

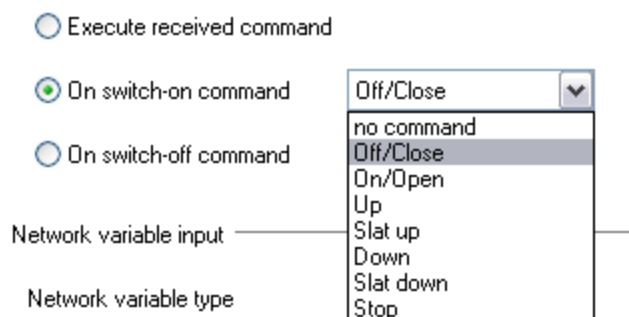
NV type	Switch-on command	Switch-off command
SNVT_switch	(100.0,1)	(0.0,0)
SNVT_setting	(SET_ON,100.0,0.00)	(SET_OFF,0.0,0.00)

On activating the priority, a series of different commands can be selected for the "On switch-on command" and "On switch-off command" types of activation, whereby those commands not listed are not relevant for the damper actuator.

Command	Meaning
No command	The priority is activated, however no command is executed
Off/close	Close valves, switch off fan
On/open	Open valves fully, switch fan to highest level

Example In our example we are using the "Execute received command" type of activation for the room climate controller. This allows us to stipulate that the object is activated with direct control commands. We will use the "On switch-on command" type of activation for the central override. "On/open" is input as the command.

The type of activation is defined separately for each input network variable; this also relates to groups (see section on groups). It is set in the object plug-in on the tab of the corresponding input variable in the section entitled "Priority".



Step 4 – How is the activity of the priorities reset?

Priorities are usually reset via direct telegrams; here the corresponding invalid value should be sent, depending on the type of NV set. With the "On switch-on command"

type of activation, switching-off causes the priority to be reset. The same applies when switching on using the "On switch-off command" type of activation. The invalid values for various types of NV are shown in the table:

NV type	Invalid value
SNVT_switch	(x, -1) any values are possible for x
SNVT_setting	(SET_NUL, x, y) any values are possible for x and y
SNVT_scene	The scene input called up must contain an invalid value (see section on scene control)
SNVT_lev_percent	(163.835)

Example In this example no cancellation is required for room climate control, as this is already the lowest priority value. Switching off causes the central override to be cancelled directly.

If an activation source is not able to trigger a cancellation directly from an invalid value (e.g. manual operation), there are 2 mechanisms available for switching the priority off again. Both alternatives are also available when using groups.

Alternative 1 – Automatic priority cancellation

First of all, a period of validity can be specified on the corresponding input network variable. If the specified time elapses without new, valid control output values being received, this event is treated as though an invalid value for cancellation had been received. This invalid value must therefore be explicitly specified below the relevant input network variable. For using the automatic priority cancellation the corresponding network variable has to be bound.

Example In our example automatic priority cancellation is not required.

Automatic priority cancellation is set in the object plug-in on the "NVI settings" tab in the section entitled "Heartbeat monitoring". It should be noted that this function cannot be used at the same time as the treatment of communications faults on the same input variable.

Heartbeat monitoring

☒ invalid after s

This value is executed on expiration of the period of validity.

Value

Value (RAW)

Automatic priority cancellation is activated by selecting "invalid after" and entering the desired period of validity. "Invalid" should be selected as a value in order to ensure cancellation of the priority on expiry of the period of validity.

Alternative 2 – Priority restore

The second mechanism allows an active though invalid priority to try to restore its validity by deactivating higher priorities by means of a special command.

Example In our example no priority restoration is required.

The restore mechanism applies across all objects for all network inputs with the same priority (even if on a group) and is configured in the object plug-in on the "Priority settings" tab in the section entitled "Restore behaviour".

Restore behaviour

These settings determine which of the selected higher priorities are reset when the selected command is sent on a network variable with the desired "NV priority".

NV priority	M	O1	W	O2	S	Command
Automatic	☒	☐	☐	☐	☐	No command
Manual	☐	☐	☐	☐	☐	No command
Override 1	☐	☐	☐	☐	☐	Off/Close
Weather	☐	☐	☐	☐	☐	On/Open
Override 2	☐	☐	☐	☐	☐	Up
						Slat up
						Down
						Slat down
						Stop

For each of the possible priorities you must first enter which of the higher priorities it can reset. If at least one priority is selected, the command must also be given as to which priority should initiate the reset. If this command is then received on the desired low priority, active priorities which are marked as resettable are reset. A priority reset can only be successfully implemented if no higher priorities are active after it. It should be noted that the return behaviour described below does not apply after a priority restoration.

Step 5 – Defining the return behaviour

The return behaviour describes what happens for each priority when it is reactivated because one/all higher priorities has/have been cancelled. You can choose between 3 different reactions for this object-wide setting:

Reaction	Description
None	The system waits until a new operating command is received which is then set normally.
Last abs. command	The last operating command received (absolute) is executed. Operating commands which were received when the priority was still active but invalid are also taken into account here.
Command	A specific command is executed

It should be noted that the response following a reset (see previous section) cannot be specified, it always corresponds to the reaction "none". To execute a specific command it is possible to choose between the commands listed, depending on the type of NV, whereby those commands not listed are not relevant for the damper actuator.

Command	SNVT_switch	SNVT_setting	SNVT_lev_percent
No command	(127.5, -1)	(SET_NUL, 127.5, 655.34)	(163.835)
Off/close	(0.0, 0)	(SET_OFF, 0.0, 0.00)	(0.000)
On/open	(100.0, 1)	(SET_ON, 100.0, 0.00)	(100.000)

If the NV type SNVT_scene is present, the scene entry called up must contain the corresponding value. The desired response can be specified in the object plug-in on the "Priority settings" in the section entitled "Return behaviour".

Return behaviour

These settings determine whether and which command is executed on returning to a priority.

Priority	Execute	Command
Automatic	Command	no command
Manual	nothing	no command
Override 1	last abs cmd	Off/Close
Weather	nothing	On/Open
Override 2	nothing	Up
		Slat up
		Down
		Slat down
		Stop

The reaction is set for each priority under "Execute" when the priority is restored. If required the command to be executed must also be selected.

Example In the example the last absolute command is executed on return to 'Automatic'.

Step 6 – Response following power resumption and RESET

If required, the activity of individual priorities can also be maintained beyond a RESET. In such cases this also influences the response following a RESET. For each priority a non-volatile memory has been set, it will be evaluated after a RESET or power resumption, if the priority was active before it. In this case the priority will be reactivated. Is one of the these priorities the valid priority after the evaluation, a configured positioning calibration (channel configuration) or a configured treatment on RESET (object configuration) will not be executed for remaining the position. If there is no active priority present, the parameterized treatment is executed following power resumption / reset.

Example In our example none of the priorities used need to be stored in a non-volatile memory.

If priorities are to be retained beyond a reset, this can be configured on the "Save priority" tab.

Save priorities "non-volatile"

Enter here the priorities which are to remain stored following a reset or power failure.

- ☐ Auto
- ☐ Manual
- ☐ Override 1
- ☐ Weather
- ☐ Override 2
- ☐ Safety

Use of groups

Group objects for controlling the damper actuators can be used. These are located on the same device and provide a network variable as an interface to all its group members. The ability to operate all output objects via a group object too means that central commands can be set up in such a way that only one network variable has to be bound for each device. Therefore, no alias table entries are used on the transmitting device, which would be required for binding the actuator objects separately.

The assignment of actuator objects to group objects has to be done in the device plug-in, as described in the relevant section. Operation of the group controllers and their parametrization are described in the section on the group objects.

Switchable network variables

Various types of network variable can be used for the damper actuator. In this way, the object can be adapted to the network interfaces available in the network.. For some functions the respective type of NV is relevant when setting the parameters, for example in the case of priority evaluation. The standard types listed may be used:

NV types	allowed for input variables	allowed for output variables
SNVT_setting	x	-
SNVT_switch	x*	-
SNVT_scene	x	-
SNVT_lev_percent	x	x

The NV type is set in the object plug-in - for input variables this is done on the "NVI settings" tab in the section entitled "Input network variable", and for output variables on the "NVO settings" tab in the section "Output network variables".

Network variable output

Network variable type

SNVT_lev_percent

SNVT_lev_percent

Network variable input _____

Network variable type SNVT_lev_percent ▼

Heartbeat monitoring _____

☐ invalid after SNVT_lev_percent
SNVT_switch
SNVT_setting
SNVT_scene s

Space usage selection (scene control)

A scene controller is available for the damper actuator, allowing it to be activated via scenes. For this the network variable provided for activation purposes should set to 'SNVT_scene'. Telegrams on the input variable are processed as follows:

SNVT_scene	Meaning
SC_LEARN, x	Save output variable as a control value for scene x
SC_RECALL, x	Call up scene x

The scene plug-in for parameterizing the scene controller is run directly on the damper actuator.

sistema MC / UniversalObject[2]

File Help

Scene Memory **Scene Memory** Logger

Scene number base _____

First scene number 15

Scene memory _____

Active	No.	Value	State
☒	15	0	0
☒	16	100	1 ▼
☐	17	0	0
☐	18	0	0
☐	19	0	0
☐	20	0	0
☐	21	0	0
☐	22	0	0
☐	23	0	0
☐	24	0	0

Ready. OK Cancel Apply

The scene controller contains a fixed number of entries, whereby the scene number of the first entry may be parameterized. All other entries have ascending numbers, as can be seen in column "No." Each entry to be used must first be activated in the column "Active". The scene entries are of type 'SNVT_switch' for the damper actuator.

Action in the event of communication faults

Faulty input telegrams (see LonMark specifications) are ignored. In order to deal with communication faults and a related possible failure of individual activation sources, an input test can be set for each input network variable. For this the activation source must support cyclic transmission and its parameters be set accordingly. If no new network telegram is received within a parameterized time period, a previously defined command is executed. This may be used for activating or deactivating the relevant priority or may contain a specific control output value.

It should be noted that this function cannot be used at the same time as automatic priority cancellation on the same input variable. Parametrization of the input test is performed for the input variable concerned in the object plug-in on the "NVI settings" tab in the section entitled "Heartbeat monitoring".

Heartbeat monitoring

☒ invalid after s

This value is executed on expiration of the period of validity.

Value user defined

Value (RAW) switch on
switch off
invalid
user defined

The input test is activated by selecting "invalid after" and entering the desired monitoring time. In addition, a value should be selected which is executed on expiry of the monitoring time, if no new telegram is received. You can choose between the values listed and the setting "User-defined".

Entry	Meaning
Switch-on	System is switched on
Switch-off	System is switched off
Invalid	Priority is cancelled
Open valve (100%) 6-way valve S2	Open valve fully / open sequence 2 fully (6-way valve only)
Close valve	Close valve fully
6-way valve S1 (- 100%)	Open sequence 1 fully (6-way valve only)

Depending on the entry, the respective control output value is used:

Entry	SNVT_switch	SNVT_setting	SNVT_lev_percent
Switch-on	(100.0, 1)	(SET_ON, 100.0, 0.00)	-
Switch-off	(0.0, 0)	(SET_OFF, 0.0, 0.00)	-
Invalid	(127.5, -1)	(SET_NUL, 127.5, 655.34)	(163.835)
Open valve (100%) 6-way valve S2	-	-	(100.000)
Close valve	-	-	(0.000)

Entry	SNVT_switch	SNVT_setting	SNVT_lev_percent
6-way valve S1 (-100%)	-	-	(-100.000)

When selecting "User-defined" the desired value must be given in raw data form according to the type of NV used.

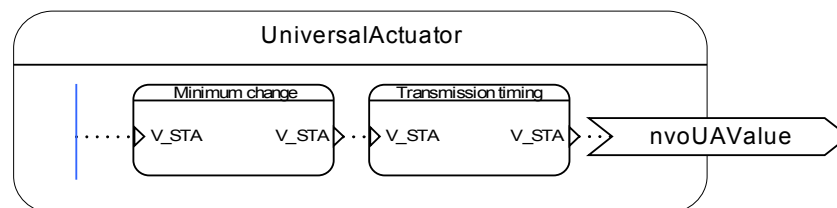
NV type	Raw format			
SNVT_switch	[.value]	[.state]	[-]	[-]
SNVT_setting	[.function]	[.setting]	[.rotation	]
SNVT_scene	[.function]	[.scene_nmbr]*	[-]	[-]
SNVT_lev_percent	[value]	[value]	[-]	[-]

* The scene input called up must contain the desired value (see section on scene control)

An input test may also be configured for group input variables. For using the input test the corresponding network variable has to be bound.

Transmission response of output variables

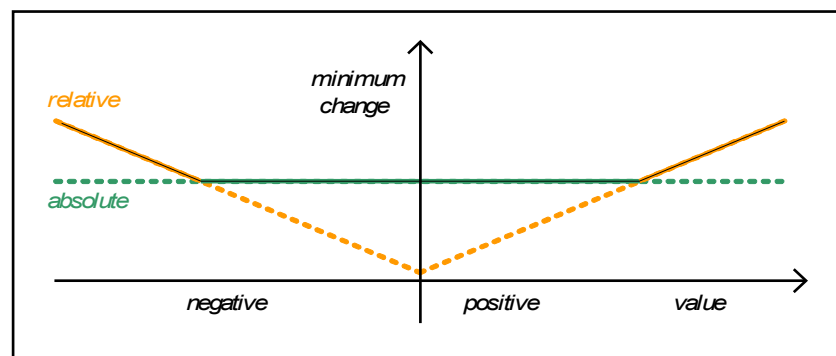
The transmission response of the output variable is determined on the basis of the minimum change request with regard to the values to be transmitted and definable transmission times.



Minimum change

It is possible to define the resolution of the output value range by setting minimum changes. In the case of objects with frequent value changes by small amounts, the bus load can be reduced in this way.

The desired minimum change of values before retransmission can be specified as absolute or relative. Absolute minimum changes require changes by a fixed amount; with relative minimum changes the required change amount increases as the values increase.



With a combination of both variants it is possible to combine constant changes with low values with increasing change requests with high values.

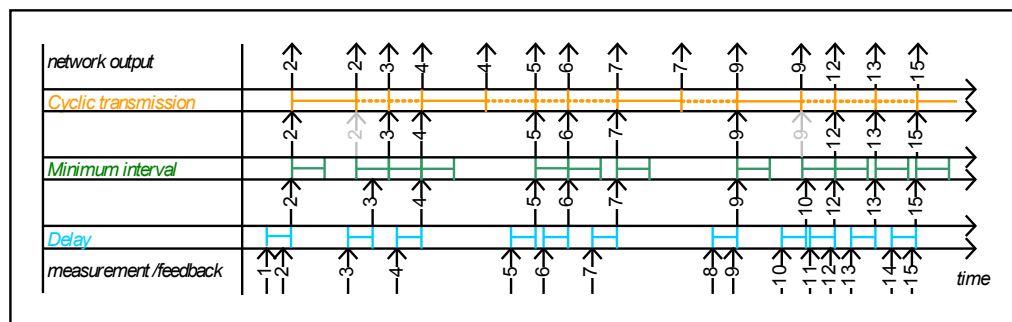
The minimum changes can be set in the object plug-in on the "Transmission response" tab in the section entitled "Value change for retransmission".

Value change for retransmission

Absolute minimum change	0,000	%
Relative minimum change	0,0	%

Time-based transmission response

There are 3 various components available for defining the time-based transmission response.



Delay

Values which are intended to be output may be delayed.

Minimum interval

A minimum time interval may be defined for successive output telegrams, to ensure the receiver has enough time to process the telegrams.

Cyclic transmission (heartbeat)

To secure the connection to the receiver the output values may be transmitted cyclically, even without taking the minimum change into account. Note here that cyclic transmission increases the bus load.

Parametrization of transmission times

The transmission times are set in the object plug-in on the "NVO settings" tab in the "Transmission interval" section.

Transmission interval for nvoUAValue

☐ Resend after		s
☒ Send no more than every	1	s
Delay sending by	0	s

Cyclic transmission is activated by selecting "Resend after"; the transmission rate can be specified. The minimum interval is activated by selecting "Send no more than

every"; the interval can be parameterized. The delay function is activated using input values greater than 0 under "Delay sending by".

4.4.4 Analog input

The analog input is used for converting physical variables into LON network telegrams with scalar content. For example, an active 0-10V temperature sensor can be converted into a network telegram of type *SNVT_temp_p*. The object behaviour can be adjusted by adapting the parameter settings of the object functions to the relevant requirements. The sensor object sends back the sensor's current measured value on its output network variable.

Overview of object functions

Extended functions are supported in addition to the VDI 3813-compliant room automation functions.

VDI3813 – Functions

- Air temperature measurement
- Brightness measurement
- Air quality measurement

Extended function

- Switchable network variable types
- Output network variable transmission response

Parametrization of object functions

The objects are parameterized using the corresponding object plug-ins. These can be started directly from the device plug-in or on the object itself.

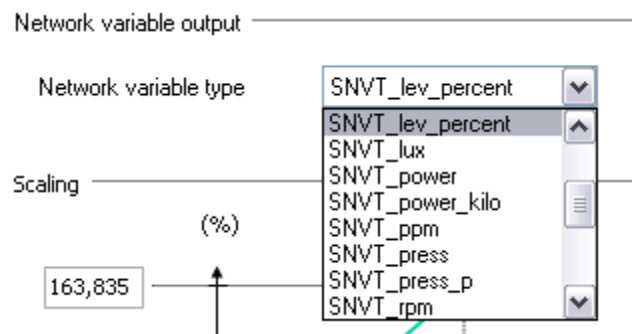
Switchable network variables

The status of the connected sensor can be read out in one of the formats listed, depending on requirements. In this way, the object can be adapted in line with the meaning of the measured value and the network interfaces.

NV types	allowed for nvo	NV types	allowed for nvo
SNVT_amp	x	SNVT_press_p	x
SNVT_amp_mil	x	SNVT_rpm	x
SNVT_angle_deg	x	SNVT_setting	x
SNVT_flow	x	SNVT_speed	x
SNVT_flow_mil	x	SNVT_speed_mil	x
SNVT_flow_p	x	SNVT_switch	x
SNVT_lev_cont	x	SNVT_temp	x
SNVT_lev_percent	x	SNVT_temp_p	x
SNVT_lux	x	SNVT_vol	x
SNVT_power	x	SNVT_vol_kilo	x

NV types	allowed for nvo	NV types	allowed for nvo
SNVT_power_kilo	x	SNVT_volt	x
SNVT_ppm	x	SNVT_volt_kilo	x
SNVT_press	x	SNVT_volt_mil	x

The type of NV is set in the object plug-in on the "General" tab in the "Output network variable" section.



Sensor acquisition

The functions listed below may be used depending on the assigned sensor:

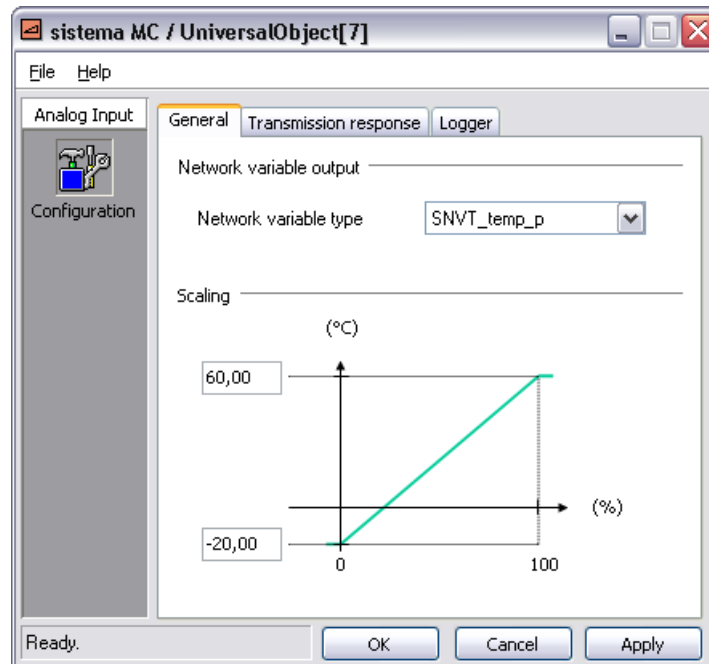
Sensor type	Air temperature measurement	Brightness measurement	Air quality measurement
Temperature sensor	x	-	-
Brightness sensor, lux meter	-	x	-
CO2 sensor, mixed gas sensor	-	-	x
Other	Standard functionality of analog input		

Standard functionality

The analog input can measure values within a measuring range specified by the hardware settings and convert them linearly into a parameterizable range of output values. Parametrization is carried out in the object plug-in on the "General" tab in the "Scaling" section. The upper and lower limit of the output value range should be indicated on the graphic display. The values which can be input are formatted according to the type of NV set and limited to the range of values of the NV type.

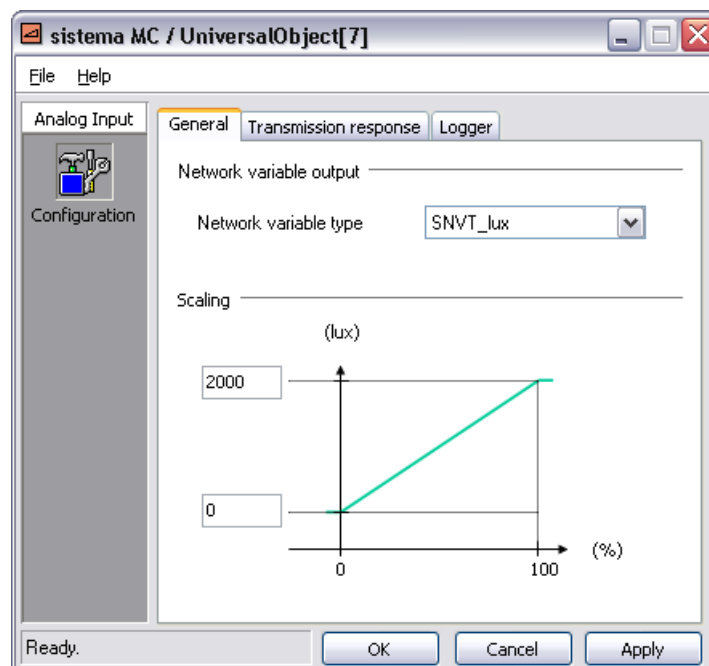
Air temperature measurement

With an air temperature measurement the temperature of a specific area is measured by a temperature sensor. Parameters are set for appropriate scaling of the output range to the range of measurement values. The smallest possible resolution is achieved based on the sensor resolution and output value formatting selected.



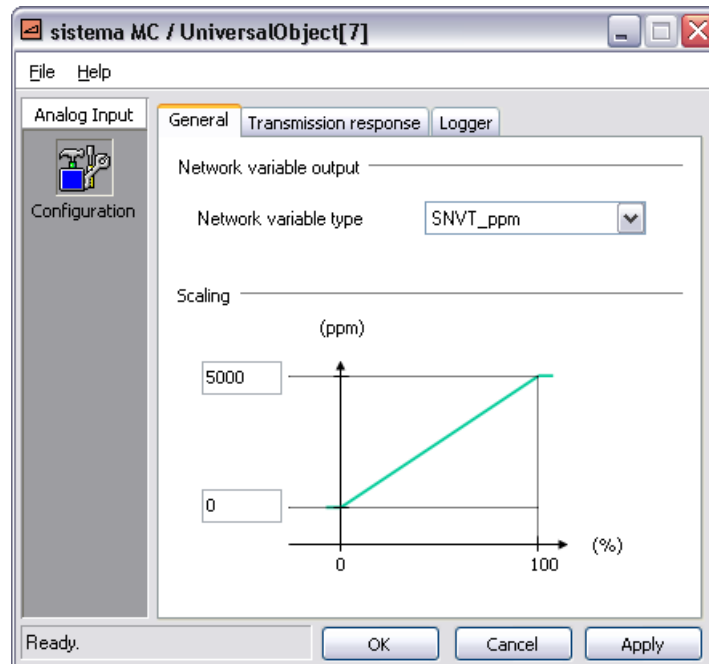
Brightness measurement

Brightness measurements are provided by a lux meter. Parameters are set for appropriate scaling of the output range to the range of measurement values. The smallest possible resolution is achieved based on the sensor resolution and output value formatting selected.



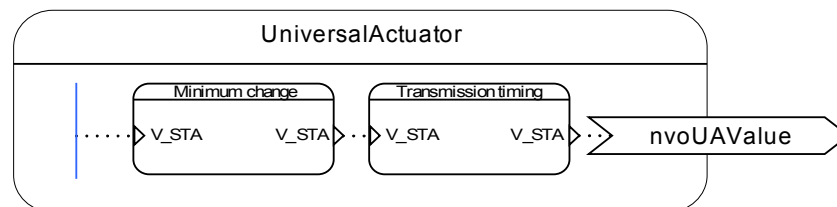
Air quality measurement

Air quality measurements are usually provided by CO₂ or mixed gas sensors. Parameters are set for appropriate scaling of the output range to the range of measurement values. The smallest possible resolution is achieved based on the sensor resolution and output value formatting selected.



Transmission response of output variables

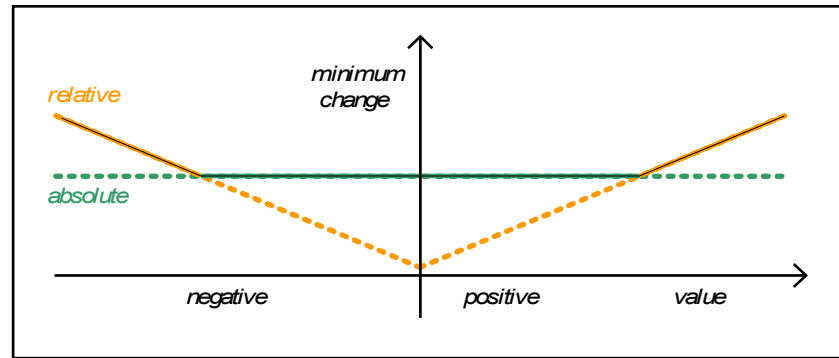
The transmission response of the output variable is determined on the basis of the minimum change request with regard to the values to be transmitted and definable transmission times.



Minimum change

It is possible to define the resolution of the output value range by setting minimum changes. In the case of objects with frequent value changes by small amounts, the bus load can be reduced in this way.

The desired minimum change of values before retransmission can be specified as absolute or relative. Absolute minimum changes require changes by a fixed amount; with relative minimum changes the required change amount increases as the values increase.



With a combination of both variants it is possible to combine constant changes with low values with increasing change requests with high values.

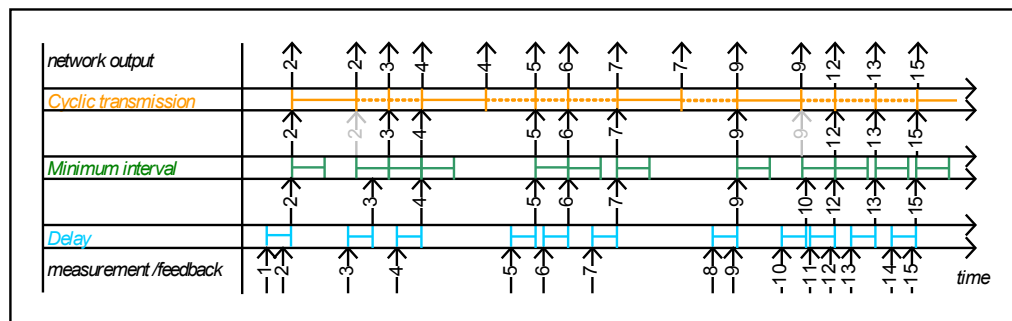
The minimum changes can be set in the object plug-in on the "Transmission response" tab in the section entitled "Value change for retransmission".

Value change for retransmission

Absolute minimum change	0,00	°C
Relative minimum change	0,0	%

Time-based transmission response

There are 3 various components available for defining the time-based transmission response.



Delay

Values which are intended to be output may be delayed.

Minimum interval

A minimum time interval may be defined for successive output telegrams, to ensure the receiver has enough time to process the telegrams.

Cyclic transmission (heartbeat)

To secure the connection to the receiver the output values may be transmitted cyclically, even without taking the minimum change into account. Note here that cyclic transmission increases the bus load.

Parametrization of transmission times

The transmission times are set in the object plug-in on the "Transmission response" tab in the "Transmission interval" section.

Transmission interval for nvoUAValue _____

☐ Resend after		\$
☒ Send no more than every	1	\$
Delay sending by	0	\$

Cyclic transmission is activated by selecting "Resend after"; the transmission rate can be specified. The minimum interval is activated by selecting "Send no more than every"; the interval can be parameterized. The delay function is activated using input values greater than 0 under "Delay sending by".

4.4.5 Binary input

The binary input enables random binary contacts to be detected and their status to be delivered to the network and can be adapted to the relevant requirements by parameterizing the object functions. The sensor object sends back the sensor's current status value on its output network variable.

Overview of object functions

Extended functions are supported in addition to the VDI 3813-compliant room automation functions.

VDI3813 – Functions

- Occupancy detection
- Window monitoring
- Dew point monitoring
- Occupancy setting

Extended function

- Switchable network variable types
- Output network variable transmission response

Parametrization of object functions

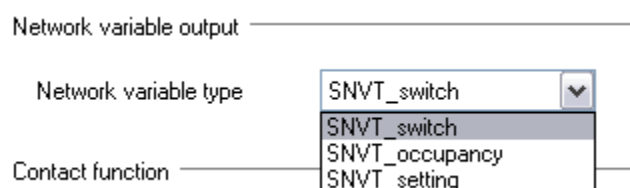
The objects are parameterized using the corresponding object plug-ins. These can be started directly from the device plug-in or on the object itself.

Switchable network variables

The status of the connected sensor can be read out in one of the formats listed, depending on requirements. In this way, the object can be adapted to the network interfaces available in the network.

NV types	allowed for output variables
SNVT_setting	x
SNVT_switch	x
SNVT_occupancy	x

The type of NV is set in the object plug-in on the "General" tab in the "Output network variable" section.



Sensor acquisition

The functions listed below may be used depending on the assigned sensor:

Sensor type	Occupancy detection	Occupancy setting	Window monitoring	Dew point monitoring
Motion sensors, occupancy sensors	x	-	-	-
Occupancy switches, key-operated switches, key cards	-	x	-	-
Window contacts	-	-	x	-
Dew point sensors	-	-	-	x
Other	Standard functionality of binary input			

Standard functionality

The binary input can differentiate between switching on and off. A telegram, which is sent when the contact status changes, is assigned to both events. A minimum hold time can be defined for switching on; the telegram for switch-off is not sent until this time has elapsed.

Parametrization is carried out in the object plug-in on the "General" tab. Depending on the output variable formatting used, you can select in the "Contact function" section whether a break contact, make contact or occupancy sensor is present.

Contact function

Function Normally open

When contact is opened, send Normally open
Normally closed
User defined

Value (RAW) 0 0 0 0

When contact is closed, send Switch on

Value (RAW) 200 1 0 0

In such cases the standard switch-on and switch-off telegrams used are input. If none of the pre-configured functions are suitable, the parameter settings for the switch-on and switch-off telegrams can be freely configured under "User-defined". To simplify the process, you can also choose between standardized and user-defined settings for the individual telegrams. The following entries are available as standard telegrams:

Telegram	SNVT_switch	SNVT_setting	SNVT_occupancy
Switch off	(0.0, 0)	(SET_OFF, 0.0, 0.00)	
Switch on	(100.0, 1)	(SET_ON, 100.0, 0.00)	-
Invalid	(0.0, -1)	(SET_NUL, 0.0, 0.00)	(OC_NUL)
Occupied	-	-	(OC_OCCUPIED)
Unoccupied	-	-	(OC_UNOCCUPIED)

Telegram	SNVT_switch	SNVT_setting	SNVT_occupancy
Bypass	-	-	(OC_BYPASS)
Standby	-	-	(OC_STANDBY)

Contact function _____

Function User defined ▼

When contact is opened, send Switch off ▼

Value (RAW) 0

When contact is closed, send Switch on ▼

Value (RAW) 200 1 0 0

When selecting "User-defined" the desired telegram must be given in raw data form according to the type of NV used.

NV type	Raw format			
SNVT_switch	[.value]	[.state]	[-]	[-]
SNVT_setting	[.function]	[.setting]	[.rotation	]
SNVT_occupancy	[occupancy]	[-]	[-]	[-]

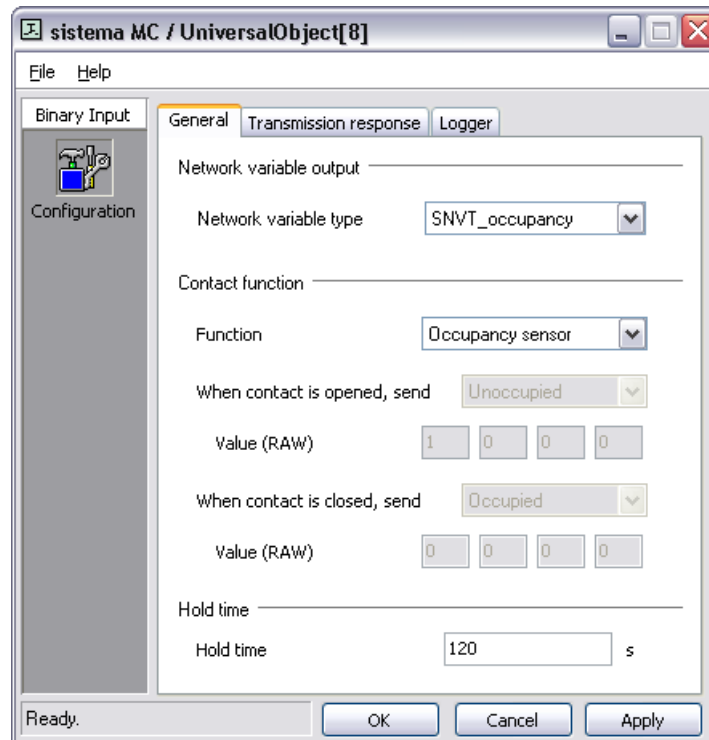
In the "Hold time" section on the "General" tab you can specify a minimum hold time for which a switch-on telegram is valid before a switch-off telegram may be sent.

Hold time _____

Hold time 0 s

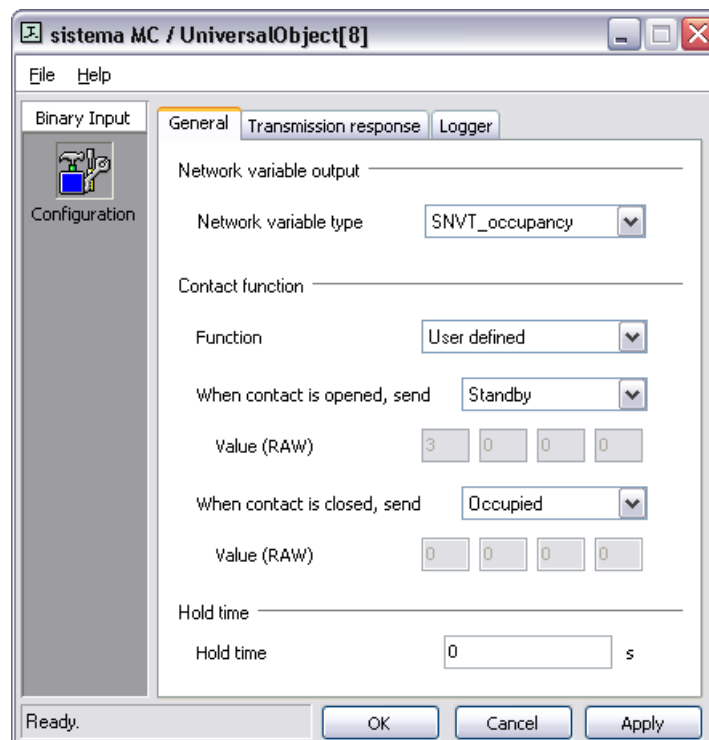
Occupancy detection

With occupancy detection the occupancy status of an area is established using motion or occupancy sensors. These sensors react when an area is occupied, usually caused by a continual, short-term change in their status. For this reason, a hold time for the occupancy status following detection may be set to prevent the system continually switching back and forth.



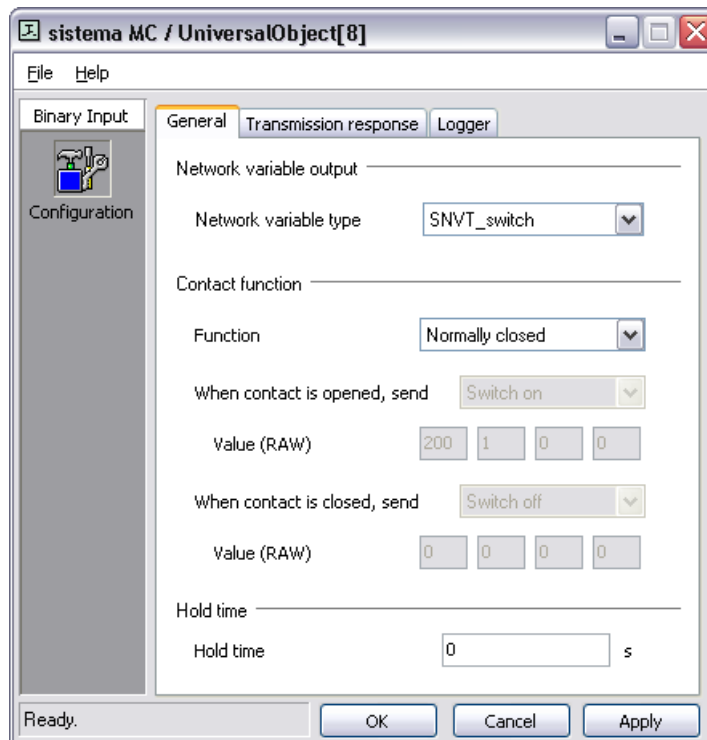
Occupancy setting

As a rule, the occupancy function is used if the occupancy status of an area is activated manually. The operating procedure can be defined by parameterizing switch-on and switch-off telegrams.



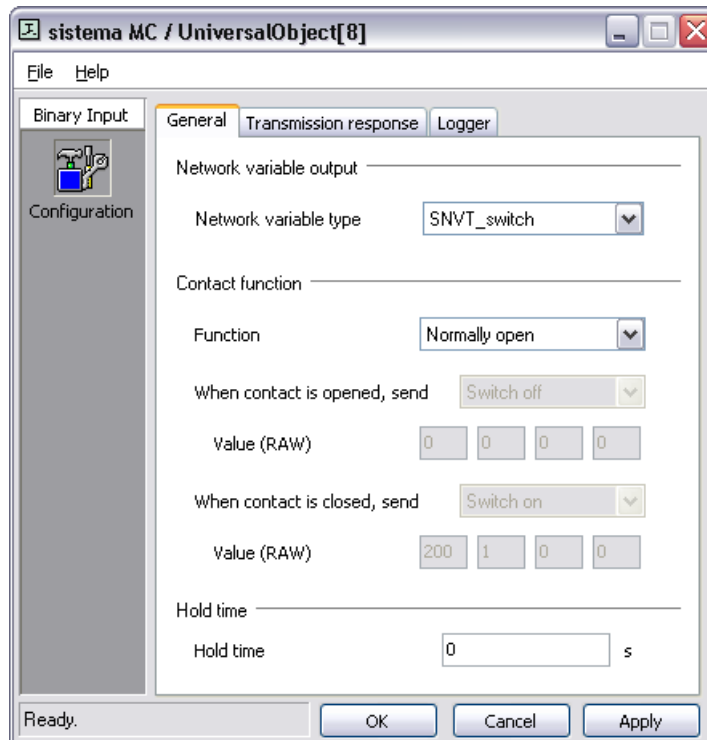
Window monitoring

The status of windows can also be monitored using the binary object. The parameters of the switch-on and switch-off telegrams of an object can be freely configured depending on the type of sensor used.



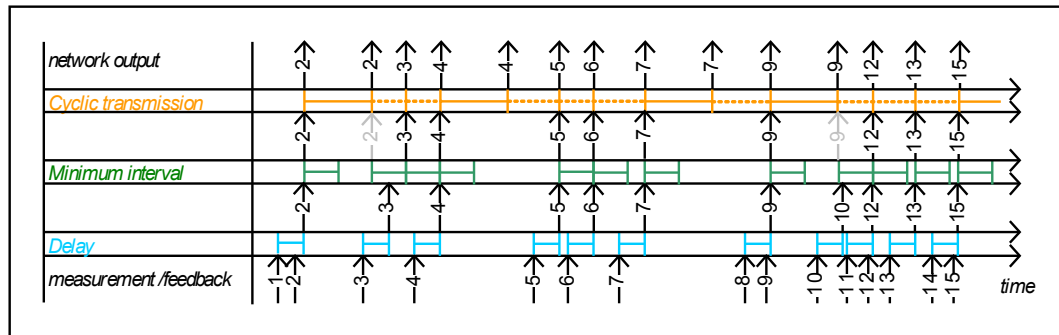
Dew point monitoring

The binary input is suitable for acquiring conventional dew point sensors; the parameters of the switch-on and switch-off telegrams can be freely configured.



Transmission response of output variables

The transmission response of the output network variable can be altered via transmission times. There are 3 various components available for defining the time-based transmission response.



Delay

Values which are intended to be output may be delayed.

Minimum interval

A minimum time interval may be defined for successive output telegrams, to ensure the receiver has enough time to process the telegrams.

Cyclic transmission (heartbeat)

To secure the connection to the receiver the output values may be transmitted cyclically, even without taking the minimum change into account. Note here that cyclic transmission increases the bus load.

The transmission times are set in the object plug-in on the "Transmission response" tab in the "Transmission interval" section.

Transmission interval for nvoUAValue

☐ Resend after s

☒ Send no more than every s

Delay sending by s

Cyclic transmission is activated by selecting "Resend after"; the transmission rate can be specified. The minimum interval is activated by selecting "Send no more than every"; the interval can be parameterized. The delay function is activated using input values greater than 0 under "Delay sending by".

4.5. Configuration of groups

The applications provide universal usable groups. The object type to be controlled has to be set in the device plug-in, as described in the relevant section. The group parametrization varies with the object type to be controlled.

4.5.1 Overview of functions

Group objects are suitable for central functions where several actuator objects need to be activated. Extended functions are supported in addition to the VDI 3813-compliant room automation functions:

VDI3813 – Functions

- Link to priority evaluation of the objects
- Space usage selection within the objects

Extended function

- Switchable network variable types
- Action in the event of communication faults
- Delayed routing of telegrams

4.5.2 Parametrization of functions

The groups are parameterized via the group plug-in. This can be started directly from the device plug-in or on the group object itself.

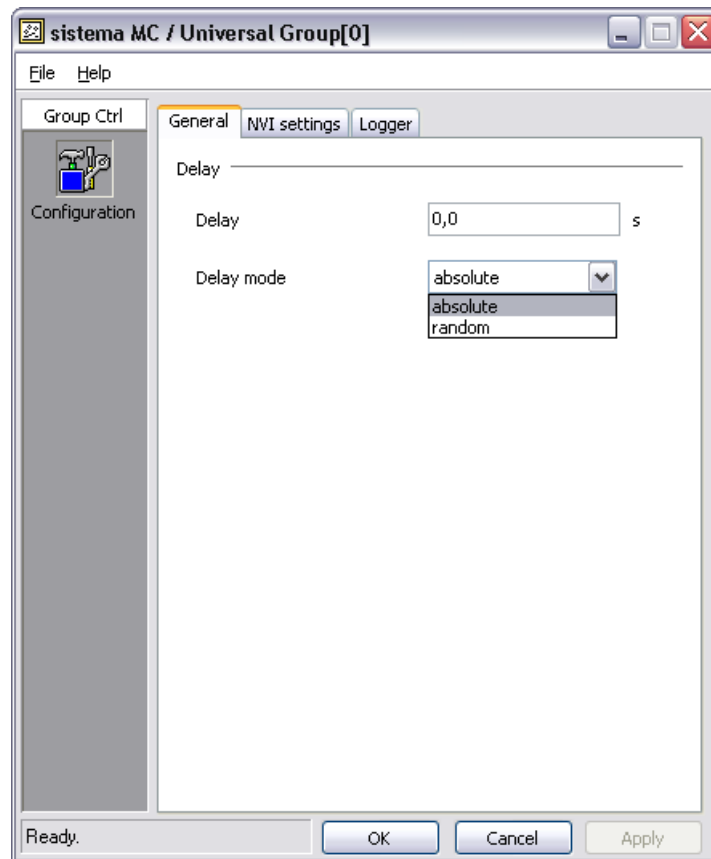
General processing of network telegrams

Routing to the members of the group takes place internally but behaves as though the input variable was on each member object directly. The part of the parametrization which has to be conducted separately for each network variable in the objects, too, is set directly in the group plug-in for the group input. All other settings for the object behaviour of the members are specified by their object parametrization. It is therefore possible to realize central functions via the groups which require different reactions from the individual members of the group.

Delayed processing of telegrams

The groups are primarily used for realizing central automation functions. Here, many actuator objects are often activated via several groups at once, which can lead to voltage peaks. To alleviate this situation the groups feature the option of delayed telegram processing. You can choose between two strategies in terms of the temporal distribution of the activation process. On the one hand, an absolute delay can be stored for each group, while on the other hand a time period can be specified within which the telegram must be processed at the latest; the group then randomly determines the respective telegram delay within the set time period.

Delayed telegram processing can be set in the group plug-in on the "General" tab.



Priority evaluation

The core function of priority evaluation is set via the object plug-ins of the group members. If group objects are used as activation sources, parts of the priority evaluation must also be set here in the relevant group plug-in.

Principle of operation

The basic functionality of priority evaluation is detailed in the description of the objects.

Parametrization

A full overview of the room and central functions in which the group members are involved is vital for setting the priority evaluation parameters. As described in the object, priority evaluation configuration takes place in several steps.

Step 1 – Selection of input variables

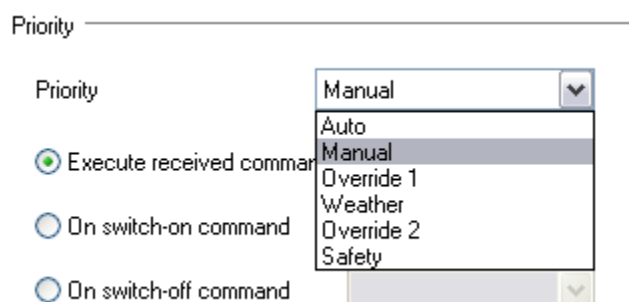
The group provides an input network variable suitable for central functions.

Step 2 – Selection of priorities

Here you must first consider which priorities are suitable for implementing the functions. In total there are 6 different priorities available with the following weighting:

Automatic < Manual < Override 1 < Weather < Override 2 < Safety

The priority is set on the respective input network variable. The priority can be set in the group plug-in on the "NVI settings" tab in section entitled "Priority".



Step 3 – Defining the type of activation

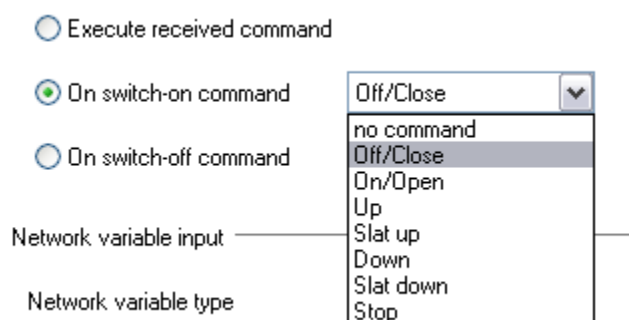
There are 3 types of activation for each input network variable. This determines how the commands received are processed.

Setting	Meaning
Execute received command	Each telegram on the input variable is set directly as a new light value.
On switch-on command	If a switch-on command is received, the command specified is executed. A switch-off command causes the priority to be retracted.
On switch-off command	If a switch-off command is received, the command specified is executed. A switch-on command causes the priority to be retracted.

The "On switch-on command" and "On switch-off command" types of activation use the following switch-on and switch-off commands, depending on the type of network variable used:

NV type	Switch-on command	Switch-off command
SNVT_switch	(100.0,1)	(0.0,0)
SNVT_setting	(SET_ON,100.0,0.00)	(SET_OFF,0.0,0.00)

On activating the priority, a series of different commands can be selected for the "On switch-on command" and "On switch-off command" types of activation; the meaning of these commands depends on the type of object activated and can be found in the relevant section for the object type. The type of activation is configured in the group plug-in on the "NVI settings" tab in the section entitled "Priority".



Step 4 – How is the activity of the priorities reset?

Priorities are usually reset via direct telegrams; here the corresponding invalid value should be sent, depending on the type of NV set. With the "On switch-on command" type of activation, switching-off causes the priority to be reset. The same applies when switching on using the "On switch-off command" type of activation. The invalid values for various types of NV are shown in the table:

NV type	Invalid value
SNVT_switch	(x, -1) any values are possible for x
SNVT_setting	(SET_NUL, x, y) any values are possible for x and y
SNVT_scene	The scene input called up must contain an invalid value (see section on scene control)
SNVT_lev_percent	(163.835)

If an activation source is not able to trigger a cancellation directly from an invalid value (e.g. manual operation), there are 2 mechanisms available for switching the priority off again. Both alternatives are also available when using groups.

Alternative 1 – Automatic priority cancellation

First of all, a period of validity can be specified on the corresponding input network variable. If the specified time elapses without new, valid control output values being received, this event is treated as though an invalid value for cancellation had been received. This invalid value must therefore be explicitly specified below the relevant input network variable. For using the automatic priority cancellation the corresponding network variable has to be bound.

Automatic priority cancellation is set in the object plug-in on the "NVI settings" tab in the section entitled "Heartbeat monitoring". It should be noted that this function cannot be used at the same time as the treatment of communications faults on the same input variable.

Heartbeat monitoring

☒ invalid after s

This value is executed on expiration of the period of validity.

Value

Value (RAW)

Automatic priority cancellation is activated by selecting "invalid after" and entering the desired period of validity. "Invalid" should be selected as a value in order to ensure cancellation of the priority on expiry of the period of validity.

Alternative 2 – Priority restore

The second mechanism allows an active though invalid priority to try to restore its validity by deactivating higher priorities by means of a special command.

The restore mechanism applies for each object to all network inputs with the same priority (even if on a group) and is configured for each individual group member in the object plug-in on the "Priority settings" tab in the section entitled "Restore behaviour". Details can be found in the section of the manual which deals with the relevant object type.

Step 5 – Defining the reset response

The reset response describes what happens for each priority when it is reactivated because one/all higher priorities has/have been cancelled. This is set for each group member in the object plug-in on the "Priority settings" tab in the "Reset response" section. Details can be found in the section of the manual which deals with the relevant object type.

Step 6 – Response following power resumption and RESET

If required, the activity of individual priorities can also be maintained beyond a RESET. In such cases this also influences the response following a RESET. The type of response is set for each group object the object plug-in on the "Priority" tab in the "Save priority" section. Details can be found in the section of the manual which deals with the relevant object type.

Switchable network variables

Various types of network variable can be used for the group. In this way, the object can be adapted to the network interfaces available in the network. For some functions the respective type of NV is relevant when setting the parameters, for example in the case of priority evaluation. The standard types permissible depend on the object type activated:

NV types	Lighting actuator	Sunblind actuator	Damper actuator
SNVT_setting	x	x	x
SNVT_switch	x	x	x
SNVT_scene	x	x	x
SNVT_lev_percent	-	-	x

The type of NV is set in the group plug-in on the "NVI settings" tab in the "Input network variable" section.

Network variable input _____

Network variable type SNVT_switch ▼

Space usage selection within the objects

If the input network variable of the group object is set to 'SNVT_scene', the scene controller present in the member objects can be used for space usage control. Once telegrams on the input variable have been forwarded to the objects, they are processed by them as follows:

SNVT_scene	Meaning
SC_LEARN, x	Save output variable as a control value for scene x
SC_RECALL, x	Call up scene x

The scene controller is parameterized via its own plug-in which can be run on the relevant member object. Parametrization of the scene controller is described in further detail in the section pertaining to the object type in question.

Action in the event of communication faults

Faulty input telegrams (see LonMark specifications) are ignored. In order to deal with communication faults and a related possible failure of individual activation sources, an input test can be set for each input network variable. For this the activation source must support cyclic transmission and its parameters be set accordingly. If no new network telegram is received within a parameterized time period, a previously defined command is executed. This may be used for activating or deactivating the relevant priority or may contain a specific control output value or movement command.

It should be noted that this function cannot be used at the same time as automatic priority cancellation on the same input variable. Parametrization of the input test is performed for the input variable concerned in the group object plug-in on the "NVI settings" tab in the section entitled "Heartbeat monitoring".

Heartbeat monitoring _____

☒ invalid after s

This value is executed on expiration of the period of validity.

Value

Value (RAW)

The input test is activated by selecting "invalid after" and entering the desired monitoring time. In addition, a value should be selected which is executed on expiry of the monitoring time, if no new telegram is received. You can choose between the values listed and the setting "User-defined". The selection and meaning of the values that may be chosen is determined by the object type to be activated.

Entry	Meaning	Lamp actuator	Sunblind actuator	HVAC actuator
Switch-on	System is switched on	x	x	x
Switch-off	System is switched off	x	x	x
Invalid	Priority is cancelled	x	x	x
Upper end position	Raise fully (on Close windows)	-	x	-
Lower end position	Lower fully (on Open windows)	-	x	-
Open valve (100%) 6-way valve S2	Open valve fully / open sequence 2 fully (6-way valve only)	-	-	x

Entry	Meaning	Lamp actuator	Sunblind actuator	HVAC actuator
Close valve	Close valve fully	-	-	x
6-way valve S1 (-100%)	Open sequence 1 fully (6-way valve only)	-	-	x

The following values are used here depending on the NV type of the input variable.

Entry	SNVT_switch	SNVT_setting	SNVT_lev_percent
Switch-on	(100.0, 1)	(SET_ON, 100.0, 0.00)	-
Switch-off	(0.0, 0)	(SET_OFF, 0.0, 0.00)	-
Invalid	(127.5, -1)	(SET_NUL, 127.5, 655.34)	(163.835)
Upper end position	-	(SET_UP, 100.0, 0.00)	-
Lower end position	-	(SET_DOWN, 100.0, 0.00)	-
Open valve (100%) 6-way valve S2	-	-	(100.000)
Close valve	-	-	(0.000)
6-way valve S1 (-100%)	-	-	(-100.000)

When selecting "User-defined" the desired value must be given in raw data form according to the type of NV used.

NV type	Raw format			
SNVT_switch	[.value]	[.state]	[-]	[-]
SNVT_setting	[.function]	[.setting]	[.rotation	]
SNVT_scene	[.function]	[.scene_nmbr]*	[-]	[-]
SNVT_lev_percent	[value]	[value]	[-]	[-]

* The scene input called up must contain the desired value (see section on scene control)

4.6. Management

The object management on the device allows status requests and reports device and object failures.

4.6.1 Overview of functions

The administrative functions are used by network management systems and the plug-ins for communication with the device and for status acquisition purposes. A building control unit or other central control units can use the following functions:

Function	Intended application
Device management	Acquisition and alteration of object statuses
Status feedback based on LonMark	Provides information on objects and assigned channels via the standard interface
Extended status feedback	Summarized status information for easier acquisition via building control systems
Device localization	Optional display of device ID

4.6.2 Functional description

Device management

Various requests and commands can be sent to the device and its function objects via the network variable *nviRequest* of the *NodeObject*.

Command	Type of command	Meaning
RQ_NORMAL	Status change	Resets function objects with an 'override' or 'disabled' status
RQ_UPDATE_STATUS	Status request	Determines the status of the device or a function object, output on nvoStatus
RQ_REPORT_MASK	Status mask	Provides all statuses which can be adopted by the device or function object, output on nvoStatus
RQ_ENABLE	Status change	Resets function objects with a 'disabled' status
RQ_DISABLED	Status change	Sets function objects to the 'disabled' status

Status feedback based on LonMark

The status of the device and individual objects can be requested via the network variable *nviRequest* of the *NodeObject*. The following commands should be used:

nviRequest	Meaning
{RQ_REPORT_MASK, 0}	Determines the status mask of the device

nviRequest	Meaning
{RQ_REPORT_MASK, n}	Determines the status mask of the function object ('n') on the device (first object after the <i>NodeObject</i> is given the number 1)
{RQ_UPDATE_STATUS, 0}	Determines the status of the device
{RQ_UPDATE_STATUS, n}	Determines the status of the function object ('n') on the device (first object after the <i>NodeObject</i> is given the number 1)

The response to the request can be found in the network variable *nvoStatus* of the *NodeObject*.

Status mask

The status mask displays which status messages are supported by the respective object. All status elements which can be adopted by the corresponding function object or device are used. Since the response has to do with a status mask, it can be seen that the element *nvoStatus.report_mask* has been set.

Statuses

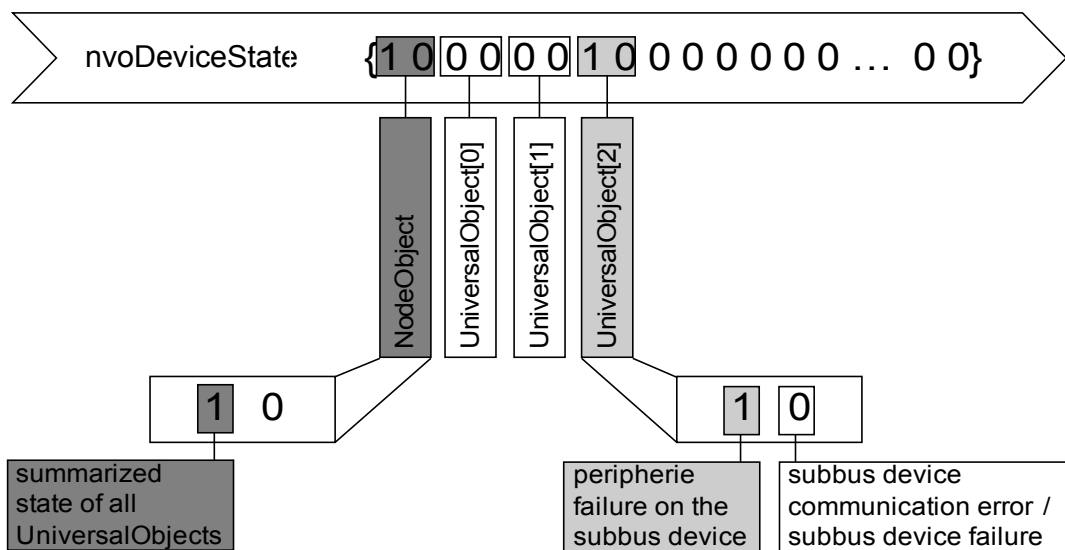
The following table gives the meaning of the elements in the response to the *nvoStatus*. You can determine from the status mask which elements an object is able to report. The reporting of hardware-related statuses depends on whether this is supported by the assigned channels and on the relevant modules.

NvoStatus. elements	Meaning
invalid_id	This element is used if the <i>.object_id</i> used for the request is invalid.
invalid_request	This element is used if the object does not support the command sent in <i>.object_request</i> .
disabled	This element shows that the object has a 'disabled' status.
open_circuit	This element shows whether there is a hardware fault or connection error on a module with a least one channel assigned to the object.
mechanical_fault	This element shows whether a fault has occurred in the I/Os of a field device assigned to the object.
feedback_failure	This element shows whether there is a communications problem with at least one of the assigned channels.
electrical_fault	This element is used if a hardware error has been identified on at least one of the assigned channels/field devices.
unable_to_measure	If a fault has occurred during the initialization of a module or an assigned channel/field device, this element is used to show it.
comm_failure	This element indicates communications faults in the LON network which have occurred on the object requested.
self_test_in_progress	This element indicates active initialization processes, synchronizations and clearance tests.

NvoStatus. elements	Meaning
locked_out	This element indicates non-parameterized devices or devices which have not been parameterized via plug-in or overridden by the plug-in.
manual_control	If one of the assigned channels is overridden, this is shown here.
in_alarm	The operating limits on one of the assigned channels/field devices have been exceeded.
report_mask	This element is used for a status mask.
alarm_notify_disabled	This element indicates that there are communication problems with a module with assigned channels, meaning that further status messages for the channels are not possible.

Extended status feedback

For easier acquisition of important object statuses during operation, the *NodeObject* offers *nvoDeviceStatus*. For using the extended status messages it is necessary to set the configuration property UCPTdeviceStateUse below *nvoDeviceState* to the value {DSU_OBJ_STATES} (2).



The statuses are shown per object to mirror the logical assignment of the field devices. 2 bits are used per object for output. The picture shows the usage of the first four objects of the device. The bits for the node object have a special position. The first bit shows if any bit for the universal objects is set. Therefore this bit can be used for evaluating the overall status. The second bit for the node object is not used and reserved for future use.

For universal objects the first bit indicates an periphery error in at least one assigned field device. The second bit indicates an hardware error or an communication problem of at least one of the assigned field devices.

Note here that testing for errors at the connected modules are executed every 2 minutes. The maximum response time for indicating an error is:

$$T_{\text{ResponseMax}} = (2 \text{ min} * \text{number of connected and configured modules})$$

Device localization

Text of 1 to 31 characters long can be stored in the *NodeObject*; this is used to identify the device position.

5. Appendix

5.1. Support

The information given in this manual was carefully compiled. Should you have any further questions regarding this product, please contact:

spega - Spelsberg Gebäudeautomation GmbH
Zechenstr. 70
D-47443 Moers
Germany
Tel. +49 (2841) 88049-0
Fax: +49 (2841) 88049-49
Email: support@spega.de

5.2. Warranty and liability

The warranty for the device - unless otherwise contractually agreed - shall be 12 months from delivery. spega cannot assume any warranty for damage to the product resulting from failure to observe the information and instructions given in this manual, or if the device is used for anything other than its intended purpose or in ambient conditions other than those specified. In such cases liability for consequential damage to persons or property is also excluded.

5.3. spega e.control plug-ins

To ensure our components can be configured and put into operation as easily as possible, spega offers convenient LNS plug-ins.

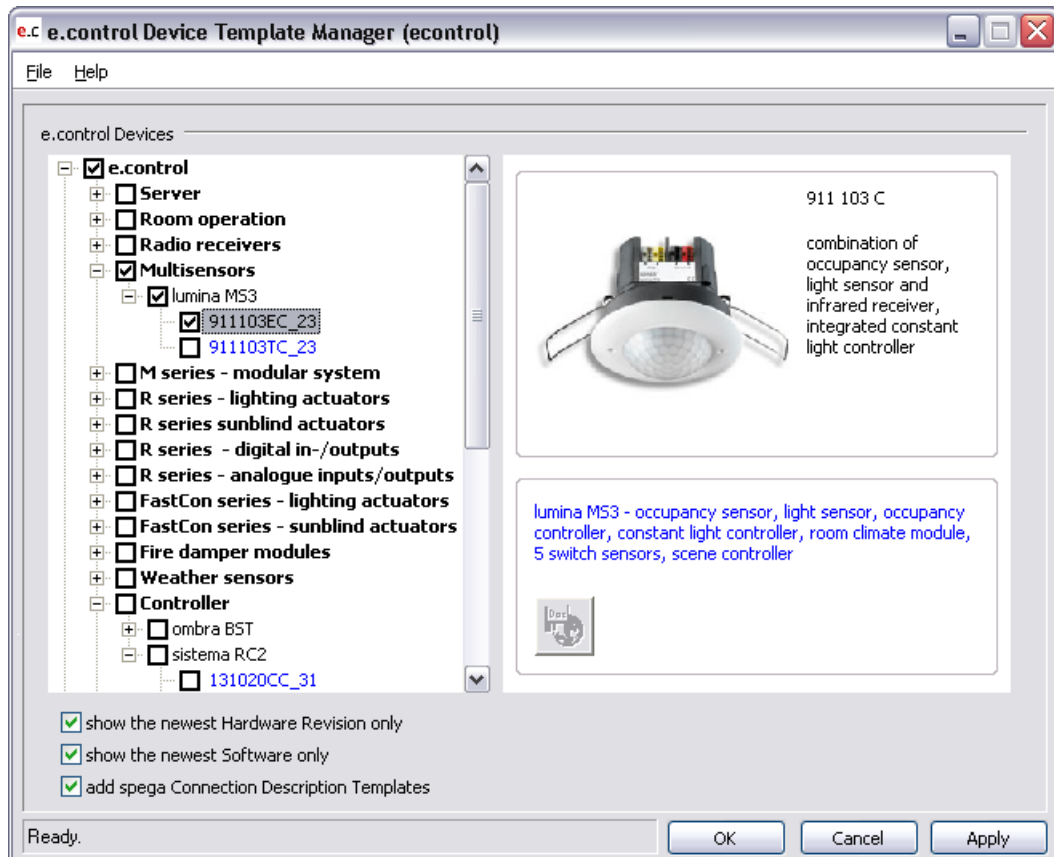
5.3.1 Installation

The spega e.control plug-in suite setup is available for download from our homepage www.spega.de or our e.control CD.

Run the file "econtrol_PlugIns.exe" and follow the instructions on the screen. Leave all components selected to install all available plug-ins.

5.3.2 Preparation for using plug-ins

Once the installation has been successfully completed, you will need to register the plug-in with the name "spega e.control Device Template Manager" in the LNS tool used. This project plug-in will then be available under the item "Add spega e.control device templates".



You will find all spega components and their applications, sorted according to the relevant category, within the tree structure of the e.control device template manager. Shown in the top right is a product photo with a brief description. Below this is a brief description of the selected application with the option of displaying the relevant software description.

If you are looking for older devices or applications, remove the "Show only current device versions" and/or "Show only current software" filter(s). If the device or application you are looking for is still not listed, please visit our homepage.

In cases where "spega Connection Description Templates" is selected, the current connection parameter templates and a brief description will be created in your LNS project.

Here you can select the relevant application for all spega devices you wish to use in your project, then click "Accept". The device templates selected are created and all available plug-ins registered.

You can then set up the devices in the usual way. The device and object plug-ins are now available for configuration and start-up support.

5.3.3 Device and object plug-ins

Both a device plug-in and an object plug-in are available for most spega components.

The device plug-in must be started first. This is where all the device-related settings, such as the reading of radio sensors or the configuration of connected consumers, are made.

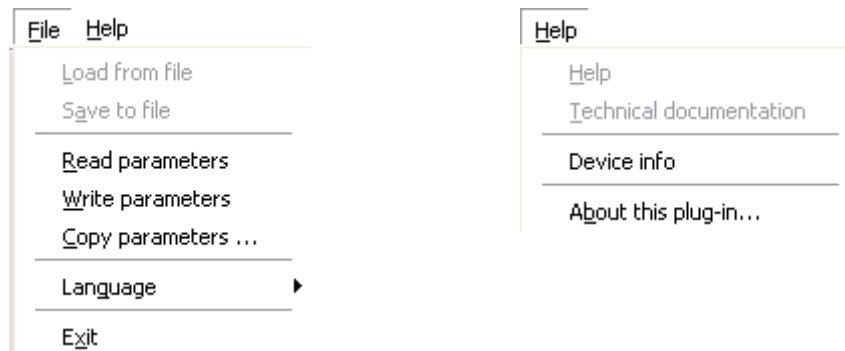
The functionality of the relevant Lonmark object can be easily configured using the object plug-in.

5.3.4 Operation of the plug-ins

Operation of the spega e.control plug-ins is simple and standardized. You will find the menu items and buttons described below. In addition, other device or object-related controls may be available and are explained in the relevant documentation.

Menu bar

The menu bar contains two entries as standard:



File

<i>Read from file (optional)</i>	Opens a parameter file and reads the parameters into the plug-in.
<i>Write to file (optional)</i>	Saves the set parameters to a parameter file.
<i>Read parameters</i>	Reads the parameters from the LNS data base into the plug-in. This is done automatically each time a plug-in is started.
<i>Write parameters</i>	Writes the parameters set in the plug-in into the data base.
<i>Transfer parameters... (optional)</i>	Used for transferring the parameters in the plug-in to several devices or objects. Further information on this function can be found under Writing parameters to several devices.
<i>Language</i>	Here you can select the language. This setting is applied to all e.control plug-ins.
<i>Exit</i>	Closes the plug-in.

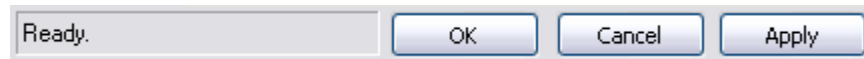
Help

<i>Help</i>	The help screen is displayed.
<i>Technical documentation</i>	The technical documentation for the device is shown.

<i>Device information</i>	Displays information on the device.
<i>About this plug-in...</i>	Displays information on the plug-in.

Buttons

The buttons at the bottom of the window are used for writing any parameters which have been changed into the LNS data base and/or closing the plug-in.



<i>Status display</i>	The status display can be found on the left next to the buttons. Current functions are shown in plain text.
<i>OK</i>	If settings in the plug-in have been changed, these are written into the LNS data base. The plug-in is then closed.
<i>Cancel</i>	The plug-in is closed. Any settings which have been changed are not written into the LNS data base.
<i>Accept</i>	Any settings which have been changed are written into the LNS data base.

Logger

All spega e.control plug-ins feature a logger which shows additional information on functions/operations which have been completed either successfully or with errors.

Logger

```
19:14:24 - Plug-in started
19:14:24 - Start reading parameters ...
19:14:24 - Reading parameters completed.
```

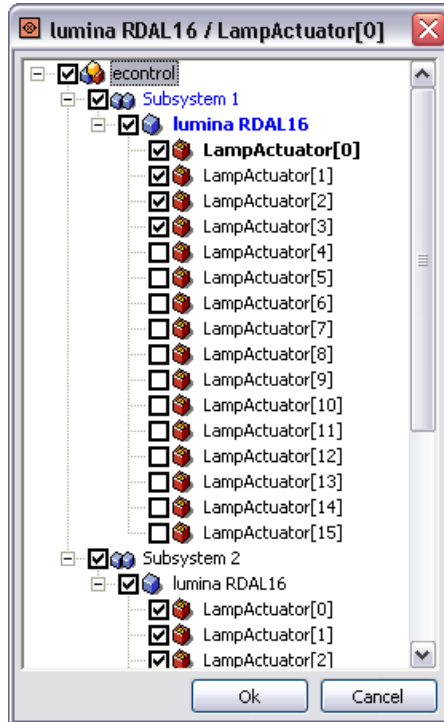
5.3.5 Saving and loading configurations

All settings made in an e.control plug-in can be saved in a file. This file may only be loaded from the plug-in from which it was created. It can, of course, also be run on another device or object.

In this way it is possible, for example, to transfer settings from one device across the LNS data base or simply to save settings and copy them in at a later date.

5.3.6 Copying configurations

The parameters set for specific device or object types can be easily copied to other destinations in the network.

**PROCEDURE:**

- Step 1:** In the 'File' menu click 'Copy parameters...'. This opens the window for selecting the destination.
- Step 2:** Choose the desired destinations by checking the relevant objects or devices. You can select entire devices or subsystems to adjust the parameter sets for larger areas.
- Step 3:** Click 'OK'. This closes the window for selecting the destination. The 'Logger' page appears in the plug-in. The parameter set is written into the LNS data base for the target devices or objects. You can track the progress in the logger.

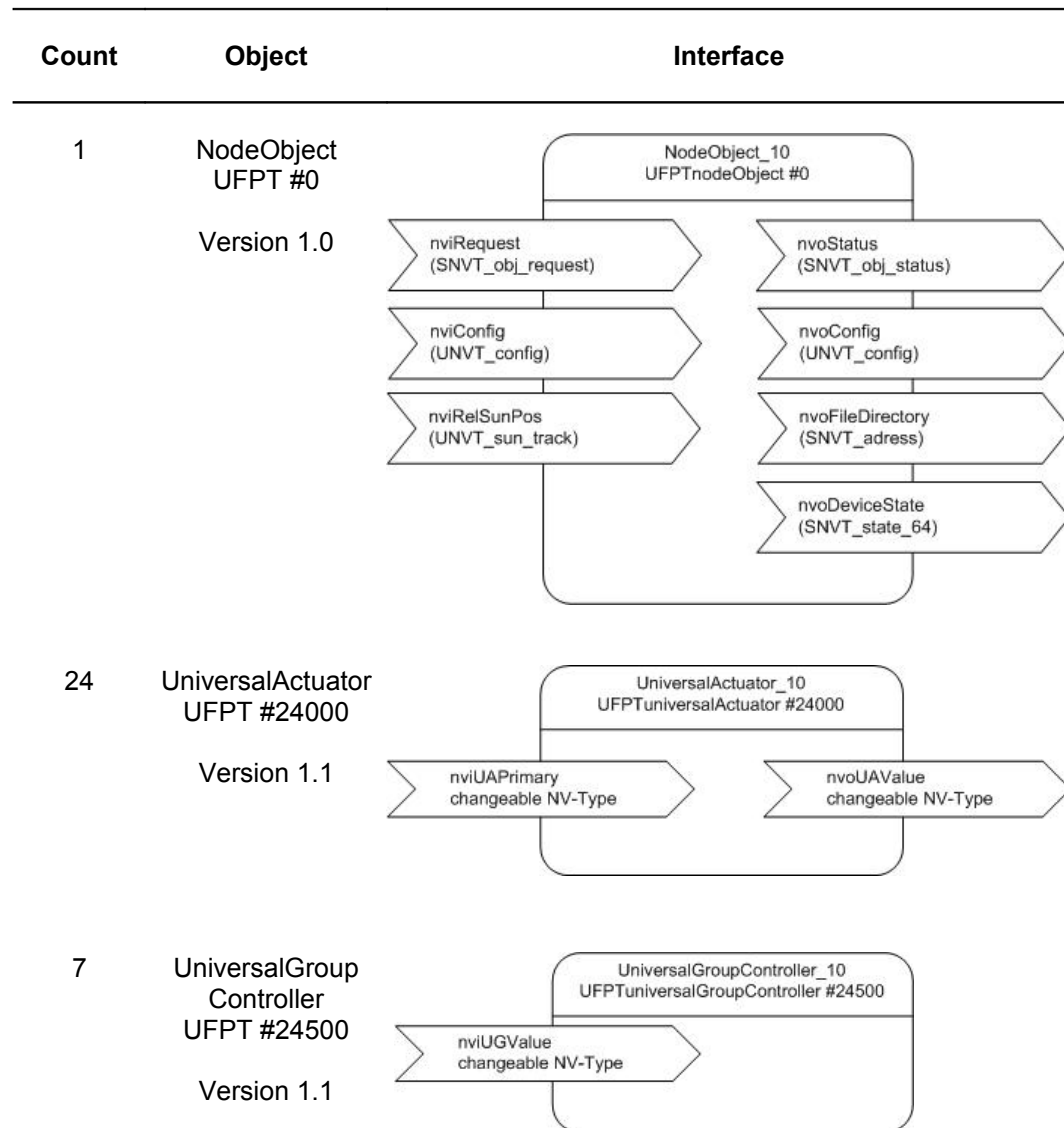
5.4. Device templates - Interfaces

This section contains a brief description of the device templates of the applications available for the device.

5.4.1 Applications

SC121000EC2_61

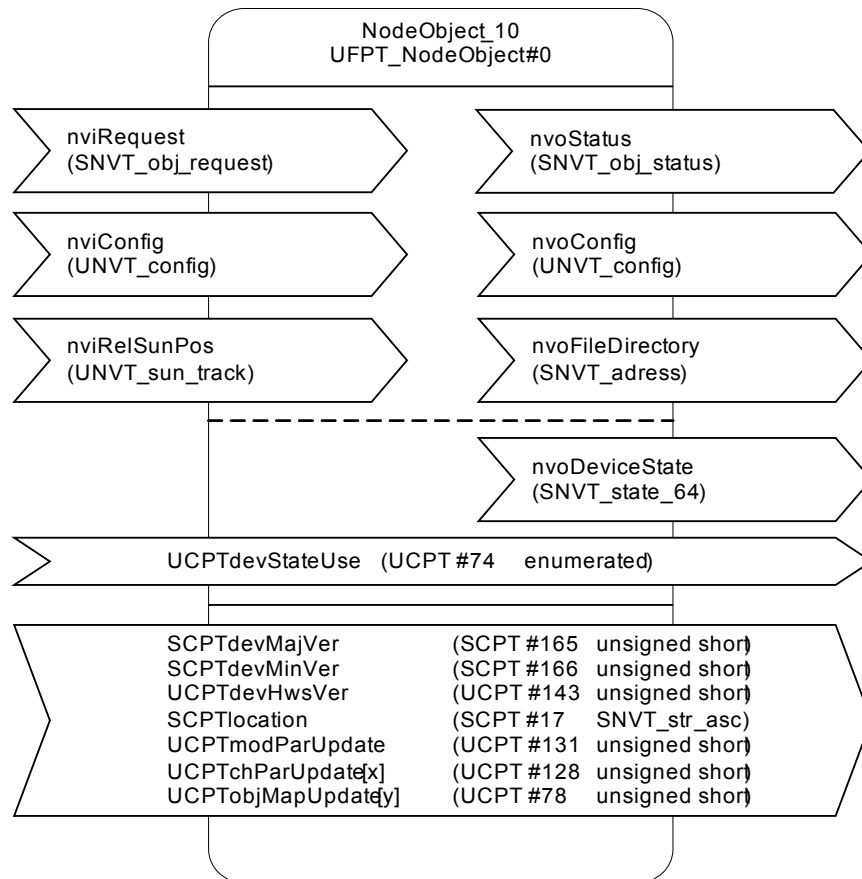
Count	Object	Interface
1	NodeObject UFPT #0 Version 1.0	<pre> graph TD subgraph NodeObject_10 [NodeObject_10 UFPTnodeObject #0] direction LR subgraph Left nviRequest[nviRequest (SNVT_obj_request)] nviConfig[nviConfig (UNVT_config)] nviRelSunPos[nviRelSunPos (UNVT_sun_track)] end subgraph Right nvoStatus[nvoStatus (SNVT_obj_status)] nvoConfig[nvoConfig (UNVT_config)] nvoFileDirectory[nvoFileDirectory (SNVT_adress)] nvoDeviceState[nvoDeviceState (SNVT_state_64)] end end </pre>
16	UniversalActuator UFPT #24000 Version 1.1	<pre> graph TD subgraph UniversalActuator_10 [UniversalActuator_10 UFPTUniversalActuator #24000] direction LR subgraph Left nviUAPrimary[nviUAPrimary changeable NV-Type] nviUASecondary[nviUASecondary* changeable NV-Type] end nvoUAValue[nvoUAValue changeable NV-Type] end </pre>
7	UniversalGroup Controller UFPT #24500 Version 1.1	<pre> graph TD subgraph UniversalGroupController_10 [UniversalGroupController_10 UFPTUniversalGroupController #24500] direction LR nviUGValue[nviUGValue changeable NV-Type] end </pre>

SC121000MC2_41

NodeObject

Version 01.00
Status 29.06.2011

Network interface



Network variables

Input network variables

nviRequest Default network input for receiving management commands
Type: SNVT_obj_request
Presetting: {0, RQ_NORMAL}

nviConfig Communication interface for plug-ins
Type: structured

nviRelSunPos Current sun position
Type: structured
Structure: typedef struct{
 SNVT_angle_deg azimuth;
 SNVT_angle_deg elevation;
 unsigned short month;
}UNVT_sun_track
Presetting: {0,0,0}

Output network variables

nvoStatus	Output of status data for received request management commands via <i>nviRequest</i> Type: SNVT_obj_status Transmission: On request via <i>nviRequest</i>	nvoFile Directory	Provides the start address of the config file directory of the device Type: SNVT_address Transmission: During file transfer or polling
nvoConfig	Communication interface for plug-ins Type: UNVT_config Transmission: on request via <i>nviConfig</i>	nvoDevice Status	Output of status messages Type: SNVT_state_64 Transmission: on value change

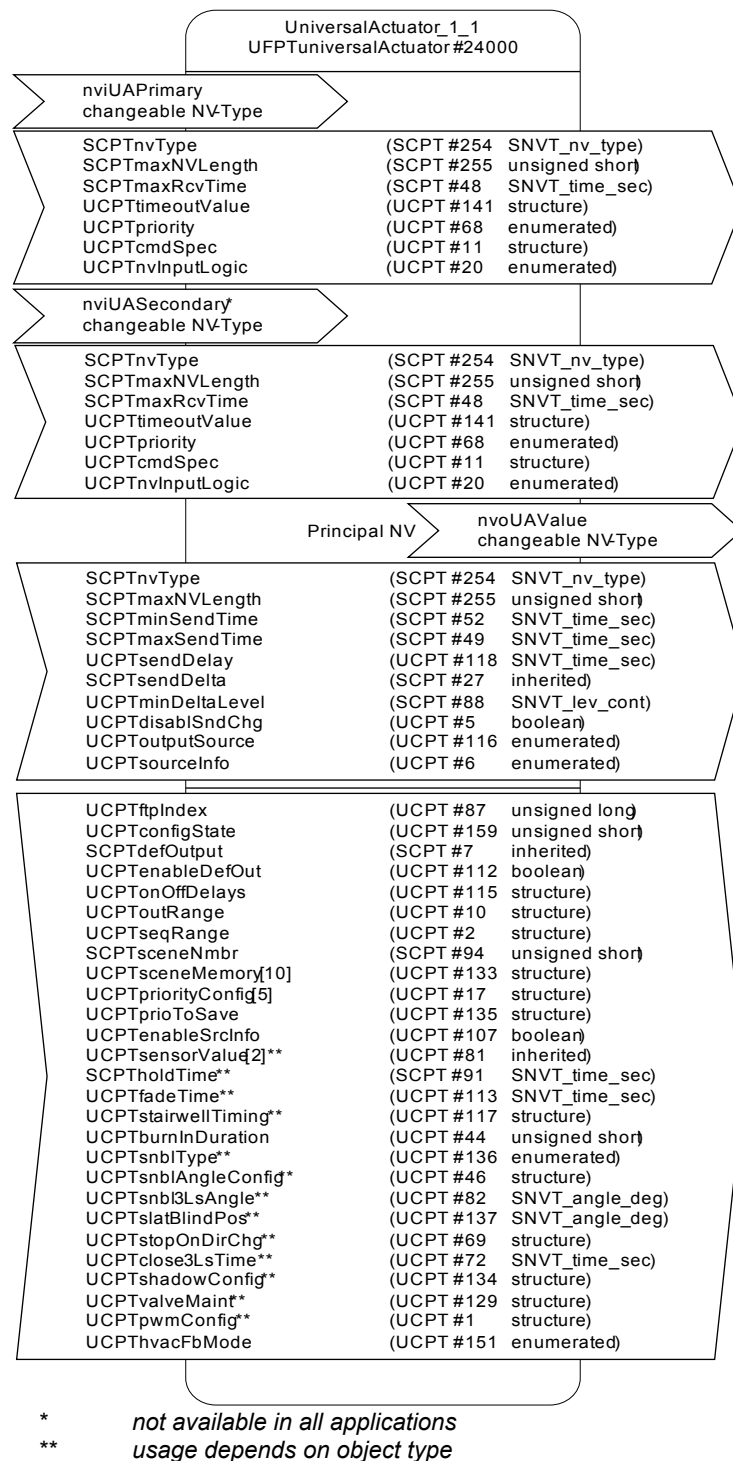
Configuration parameters

SCPTdevMajVer	Major version of the application Type: SCPT #165 (read only) unsigned short Value: Application specific	UCPTchPar Update[x]	For marking changes made by the plug-in Type: UCPT #128 unsigned short Value: Used by plug-in only
SCPTdevMinVer	Minor version of the application Type: SCPT #166 (read only) unsigned short Value: Application specific	UCPTobjMap Update[y]	For marking changes made by the plug-in Type: UCPT #78 unsigned short Value: Used by plug-in only
UCPTdevHwsVer	Configuration specific minor version of the application Type: UCPT #143 (read only) unsigned short Value: Application specific	SCPTlocation	Extended description of the device location Type: SCPT #17 SNVT_str_asc Presetting: { 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 }
UCPTmodPar Update	For marking changes made by the plug-in Type: UCPT #131 unsigned short Value: Used by plug-in only	UCPTdevice StateUse	Output mode for nvoDeviceState Type: UCPT #74 enumerated Presetting: Channel states {DSU_CH_STATES}

Universal actuator

Version	01.01
Status	01.01.2013

Network interface



Network variables

nviUAPrimary Primary input of the actuator

Type: changeable

Default type: SNVT_setting

Range of values : Depends on nv type

Presetting: 0/OFF
{SET_OFF, 0.0, 0.00}

Heartbeat control: Adjustable via SCPTmaxRcvTime

nviUA Secondary*	Secondary input of the actuator	Type: changeable	Default type: SNVT_setting	Range of values : Depends on nv type	Presetting: Depends on nv type	Transmission: Transmission timing is configurable
		Type: changeable	Default type: SNVT_setting	Range of values : Depends on nv type	Presetting: 0/OFF {SET_OFF, 0.0, 0.00}	
	Heartbeat control:	Adjustable via SCPTmaxRcvTime				
* not available in all applications						
nvoUAValue	Output of the actuator , Principal NV (this type is used for the inherited configuration properties)					

Configuration parameters

Parametrization of the network variables

SCPTnvType	Type definition of the network variable	SCPTmax NVLength	Maximum length of the network variable (read only)
Type:	Structure (SCPT #254)	Type:	unsigned short (SCPT #255)
Range of values:	Supported nv types	Presetting:	4 Bytes {4}
Presetting:	SNVT_setting {0,0,0,0,0,0,0,0,117, NVT_CAT_REFERENCE ,4,0L,0L,0L}		

Parametrization of input network variables

SCPTmax RcvTime	Maximum receive time for messages on <i>nviUAPrimary</i>	Range of values	Depends on nvi type
Type:	SNVT_time_sec (SCPT #48)	Presetting:	Depends on nvi type
Range of values:	0,0 ... 6553,5 seconds		
Presetting:	0 seconds {0}		
UCPTtimeout Value	Command for transmission failure		
Type:	4 Bytes, format from <i>nviUAPrimary</i> (UCPT #141)		

UCPTpriority	priority/function of <i>nviUAPrimary</i>	UCPTcmdSpec	type of control on <i>nviUAPrimary</i>
Type:	enumerated (UCPT #68)	Type:	structure (UCPT #11)
Range of values:	-3 PRI_REMOTE external priority control -2 PRI_LIMIT limiting -1 PRI_NUL invalid value 0 PRI_AUTO automatic 1 PRI_MAN manual control 2 PRI_OVR1 override 1 3 PRI_WEATHER sunblind protection 5 PRI_OVRD2 override 2 6 PRI_SAFETY Safety	Structure:	typedef struct{ unsigned cmd_use :4 unsigned cmd_index :4 }
Presetting:	Depends on object type	Range of values:	.cmd_use 0 CMDU_DIRECT direct value 1 CMDU_LOCK lock command 2 CMDU_RELEASE release command 3 CMDU_LOW_LIMIT lower limit 4 CMDU_HIGH_LIMIT upper limit .cmd_index entry index of device parameter UCPTcmdTable, where the command for locking is defined (only for CMDU_ LOCK, CMDU_RELEASE)
		Presetting:	{0 0}

Parametrization of input network variables

SCPTmin SendTime	Minimum time between two telegrams	UCPToutput Source	Data source for values on <i>nvoUAValue</i>
Type:	SNVT_time_sec (SCPT #52)	Type:	enumerated (UCPT #116)
Range of values:	0,0 ... 6553,5 seconds	Range of values:	-1 OUS_NUL no output 0 OUS_FB_STATE value from hardware 1 OUS_NET_PRIO NV telegram after processed by priority control 2 OUS_OUT_STATE control value after processed by object 3 OUS_NET_CMD all nv telegrams 4 OUS_OBJ_VALUE value from hardware after processed by object
Presetting:	0,1 second {1}	Presetting:	Depends on object type
SCPTmax SendTime	Maximum time between two telegrams		
Type:	SNVT_time_sec (SCPT #49)		
Range of values:	0,0 ... 6553,5 seconds		
Presetting:	0,0 second {0}		
UCPTnvInput Logic	For future use		
Type:	enumerated (UCPT #20)		
Range of values:	-		
Presetting:	invalid (-1)		

UCPTsource Info	For future use	SCPTminDelta Lvl	relative minimum change on value
Type:	enumerated (UCPT #6)	Type:	SNVT_lev_percent (SCPT #88)
Range of values:	-	Range of values:	0,0% ... 100,0%
Presetting:	invalid (-1)	Presetting:	0,0% {0}
UCPTsendDelay	Send delay	UCPTdisablSnd Chg	no transmission of value changes outside of a parametrized cycle
Type:	SNVT_time_sec (UCPT #118)	Type:	boolean (UCPT #5)
Range of values:	0,0 ... 6553,5 seconds	Range of values:	0 transmitt changes 1 only cyclic transmission
Presetting:	0,0 seconds {0}	Presetting:	transmitt changes {0}
SCPTsndDelta	Absolute minimum change on value		
Type:	inherited (SCPT #27)		
Range of values:	Depends on nvo type		
Presetting:	Depends on nvo type		

General parametrization of the object

UCPTftpIndex	Index of the used functional profile	UCPTconfig State	only used by Plug-in
Type:	unsigned long (UCPT #87)	Type:	unsigned short (UCPT #195)
Range of values:	65535 no profile 21400 LampActuator 22400 SunblindActuator 23400 DamperActuator 21202 BinaryInput 520 AnalogInput 521 AnalogOutput	Range of values:	-
Presetting:	No profile {65535}	Presetting:	-
SCPTdefOutput	Control value / movement command on voltage recovery (Execution depends on active priority and the setting of <i>UCPTenableDefOutput</i>)	UCPTenable DefOutput	Determines if <i>SCPTdefOutput</i> is valid
Type:	inherited (SCPT #7)	Type:	boolean (UCPT #112)
Range of values:	Depends on nvo type	Range of values:	FALSE <i>SCPTdefOutput</i> is invalid TRUE <i>SCPTdefOutput</i> is valid
Presetting:	Depends on nvo type	Presetting:	invalid {FALSE}
		UCPToutRange	Limit of the output range
		Type:	structure (UCPT #10)
		Structure:	typedef struct{ SNVT_lev_percent min_output; SNVT_lev_percent max_output; }
		Range of values:	<i>.min_output</i> / <i>.max_output</i> -100,00% ... 100,00 %
		Presetting:	0,00% - 100% {0 20000}

UCPTonOff Delays	Delay settings Type: structure (UCPT #115) Structure: <code>typedef struct{ SNVT_time_sec on_delay; SNVT_time_sec off_delay; unsigned use_on_auto :1; unsigned use_on_man :1; unsigned use_on_ovrd1 :1; unsigned use_on_weather :1; unsigned use_on_ovrd2 :1; unsigned use_on_safety :1; };</code> Range of values: <i>.on_delay / .off_delay</i> 0,0 ... 6553,5 seconds <i>.use_on_*</i> 0 no delays 1 use on_delay and off_delay Presetting: No delays {0 0 0 0 0 0 0}	UCPTscene Memory	Scene memory entries Type: structure (UCPT #133) Structure: <code>typedef struct{ unsigned active :1; unsigned enable_learn :1; unsigned short type; unsigned short value[4]; };</code> Range of values: <i>.active / .enable_learn</i> 0 not active / no learning 1 active and learning allowed <i>.type</i> nv type index of supported nv types <i>.value[4]</i> control value / movement command formatted according to the format of the specified nv type Presetting: ---
UCPTseqRange	Valid input value range (sequence control) Type: structure (UCPT #2) Structure: <code>typedef struct{ SNVT_lev_percent min_range; SNVT_lev_percent max_range; unsigned use_on_auto :1; unsigned use_on_man :1; unsigned use_on_ovrd1 :1; unsigned use_on_weather :1; unsigned use_on_ovrd2 :1; unsigned use_on_safety :1; };</code> Range of values: <i>.min_range / .max_range</i> -100,00% ... 100,00% <i>.use_on_*</i> 0 no sequence control 1 use min_range and max_range Presetting: No sequence control {0 20000 0 0 0 0 0}	UCPTpriority Config	Priority configuration (do this via object plug-in) Type: structure (UCPT #17) Structure: <code>typedef struct{ unsigned return_cmd :4; unsigned get_back_cmd :4; unsigned return_behave :2; unsigned g_b_f_man :1; unsigned g_b_f_ovrd1 :1; unsigned g_b_f_weather :1; unsigned g_b_f_ovrd2 :1; unsigned g_b_f_safety :1; };</code> Range of values: <i>.*_cmd</i> 0 ... 15 command index of device parameter <i>UCPTcmdTable</i> <i>.return_behave</i> 0 REBH_NUL do nothing 1 REBH_LAST_CMD recall last absolute positioning value 2 REBH_SPECIFIC_CMD use specific control value / movement command <i>.get_back_from_*</i> 0 recall from this priority permitted 1 recall from this priority allowed Presetting: {0 0 0 0 0 0 0}
SCPTscene Nmbr	Number of the first scene of the scene memory (next scene indexes are ascending) Type: unsigned (SCPT #94) Range of values: 1 ... 255 Presetting: 1		

UCPTprioTo Save	Saving priorities	UCPTenable SourceInfo	For future use
Type:	structure (UCPT #135)	Type:	boolean (UCPT #107)
Structure:	typedef struct{ unsigned save_auto :1; unsigned save_man :1; unsigned save_ovrd1 :1; unsigned save_weather :1; unsigned save_ovrd2 :1; unsigned save_safety :1; }	Range of values:	-
Range of values:	0 do not save 1 save non-volatile	Presetting:	Do not use (0)
Presetting:	Do not save {0 0 0 0 0 0}		

Object-type-specific parametrization

UCPTstairwell Timing	Stairwell lighting configuration	UCPTfadeTime	Fade time
Type:	structure (UCPT #117)	Type:	SNVT_time_sec (UCPT #113)
Structure:	typedef struct{ SNVT_time_sec auto_off_time; UNVT_sec off_warn_time; UNVT_sec warn_blink_interval; SNVT_lev_cont warn_time_value; unsigned break_auto_off :1; unsigned restart_auto_off :1; unsigned use_on_auto :1; unsigned use_on_man :1; unsigned use_on_ovrd1 :1; unsigned use_on_weather :1; unsigned use_on_ovrd2 :1; unsigned use_on_safety :1; }	Range of values:	0 ... 6553,4 seconds
Range of values:	.auto_off_time 0,1 ... 6553,4 seconds .off_warn_time / .warn_blink_interval 0 ... 255 seconds .warn_time_value 0,0 ... 100,0% .break_auto_off / .restart_auto_off 0 early swith-off and duration extension not allowed 1 early swith-off and duration extension not allowed .use_on_* 0 no stairwell timing 1 use stairwell timing	Presetting:	5,0 seconds {50}
Presetting:	{0 0 0 0 0 0}	UCPTsbnblType	Type of blind to be controlled
UCPTburnIn Duration	For future use	Type:	enumerated (UCPT #136)
Type:	unsigned short (UCPT #44)	Range of values:	0 BT_SHUTTER shutter 1 BT_AWNING awning 2 BT_VENETIAN ventian blind 3 BT_WINDOW window 5 BT_VENETIAN_3LS ventian blind with 3 end positions -1 BT_NUL no type specified
		Presetting:	no type specified {-1}
		UCPTsbnbl AngleConfig	Slat angle configuration for venetian blind
		Type:	structure (UCPT #46)
		Structure:	typedef struct{ SNVT_angle_deg angle_down; SNVT_angle_deg angle_up; }
		Range of values:	.angle_down / .angle_up -180° ... 180°
		Presetting:	-20° 60° {64536 3000}

UCPTslat BlindPos	Slat angle for the lower blind position (2 nd end position) after drive down command	UCPTclose3Ls Time	maximum time gap allowed between 2 following down commands to travel to 3 rd end position
Type: SNVT_angle_deg (UCPT #137)		Type: SNVT_time_sec (UCPT #72)	
Range of values: -180° ... 180°		Range of values: 0 ... 6553,5	not used seconds
Presetting: -10° {65036}		Presetting: not used {0}	
UCPTstopOn DirChg	Determines the behaviour when a relative movement command in the opposite direction is received during the blinds are moving	UCPTpwm Config	Parameter for pulse width modulation
Type: structure (UCPT #69)		Type: structure (UCPT #1)	
Structure: typedef struct{ unsigned stop_on_auto :1; unsigned stop_on_man :1; unsigned stop_on_ovrd1 :1; unsigned stop_on_weather :1; unsigned stop_on_ovrd2 :1; unsigned stop_on_safety :1; unsigned stop_on_remote :1; }		Structure: typedef struct{ SNVT_time_sec cycle_time; SNVT_lev_cont max_on; }	
Range of values: .stop_on_* TRUE stop only FALSE stop and execute new command		Range of values: .cycle_time 0 no PWM 1,0 ... 6553,5 s PWM-Cycle .max_on 0,5 ... 100,0% max. position	
Presetting: Stop only for priorities MAN and OVRD1 {0:1:1:0:0:0:0}		Presetting: No PWM {0, 200}	
UCPTshadow Config	data of shadow casters (used by e.control annual shading-dependent control)	UCPTvalve Maint	configuration of valve rinsing
Type: structure (UCPT #134)		Type: structure (UCPT #129)	
Structure: typedef struct{ struct obj{ signed long a_left; unsigned a_spawn; signed e_left; signed b_lin; unsigned c_sq; unsigned season; } obj[5]; SNVT_setting shaded_pos; }		Structure: typedef struct{ unsigned maint_period; unsigned accept_on_values:1; unsigned end_on_off:1; }	
Range of values: Used by plug-in only		Range of values: .maint_period 0 no valve rinsing 1...63 prior days of inactivity .accept_on_values TRUE accept on values under 100% FALSE ignore on values under 100% .end_on_off TRUE valve rinsing ends on off values FALSE off values can't stop valve rinsing	
Presetting: no shadow caster		Presetting: valve rinsing after 7 prior days of inactivity, accepting on values under 100 % and ignoring off values	
UCPTsnbl3Ls Angle	Slat angle for the 3 rd end position		
Type: SNVT_angle_deg (UCPT #82)			
Range of values: -180° ... 180°			
Presetting: -50° {63036}			

UCPTsensor Value[2]	values to convert input signals	UCPThvacFb Mode	type of feedback value for MP-Bus devices
Type: inherited (UCPT #81)		Type: enumerated (UCPT #151)	
Range of values: Depends on nvo type Index state 0 on closed contact 1 on open contact		Range of values: 0 POS_ABS position absolute 1 POS_REL position relative 2 FLOW_ABS flow absolute 3 FLOW_REL flow relative	
Presetting: Depends on nvo type		Presetting: position absolute {0}	
SCPTholdTime	hold time for state on		
Type: SNVT_time_sec (SCPT #91)			
Range of values: 0 ... 6553,4 Sek.			
Presetting: no hold time {0}			

Use of general configuration properties

Some of the general configuration properties will not be used by all object types:

Object type	UCPToutRange	UCPTseqRang	UCPTonOffDelays	UCPTsceneNmbr	UCPTsceneMemory	UCPTpriority	UCPTcmdSpec
Lamp actuator	x	x	x	x	x	x	x
Sunblind actuator	-	-	-	x	x	x	x
Damper actuator	x	x	-	x	x	x	x
Analog output	x	x	-	-	-	x	x
Binary input	-	-	-	-	-	-	-
Analog input	-	-	-	-	-	-	-

Use of Object-type-specific configuration properties

The Object-type-specific configuration properties will be used by the object types as shown in table:

Object type	UCPTstairwellTiming	UCPTfadeTime	UCPTsnblType	UCPTsnblAngleConfig	UCPTslatBlindPos	UCPTstopOnDirChg	UCPTclose3LsTime	UCPTsnbl3LsAngle	UCPTshadowConfig	UCPTdisclLevelVals	UCPTpwmConfig	UCPTValveMaint	UCPTsensorValue	UCPTTholdTime	UCPTThvacFbMode
Lamp actuator	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunblind actuator	-	-	x	x	x	x	x	x	x	-	-	-	-	-	-
Damper actuator	-	-	-	-	-	-	-	-	-	x	x	x	-	-	x
Analog output	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Object type	UCPTstairwellTiming	UCPTfadeTime	UCPTsnblType	UCPTsnblAngleConfig	UCPTslatBlindPos	UCPTstopOnDirChg	UCPTclose3LsTime	UCPTsnbl3LsAngle	UCPTshadowConfig	UCPTdiscLevelVals	UCPTpwmConfig	UCPTValveMaint	UCPTsensorValue	UCPTTholdTime	UCPTThvacFbMode
Binary input	-	-	-	-	-	-	-	-	-	-	-	-	x	x	-
Analog input	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-

With following restrictions:

Lamp actuator

Parameter Lamp type	UCPTstairwellTiming	UCPTfadeTime
dimnable	x	x
only switchable	x	-

Sunblind actuator

Parameter Actuator type	UCPTsnblAngleConfig	UCPTsnbl3LsAngle	UCPTslatBlindPos	UCPTclose3LsTime	UCPTshadowConfig
shutter	-	-	-	-	x
awning	-	-	-	-	x
window	-	-	-	-	-
venetian blind	x	-	x	-	x
ventian blind (3 positions)	x	x	x	x	x

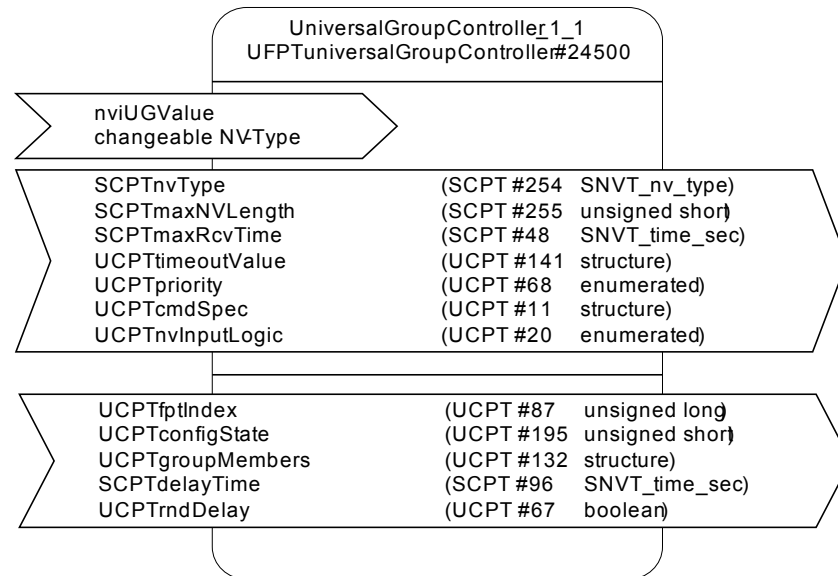
Damper actuator

Parameter Type of drive	UCPTpwmConfig	UCPTvalveMaint
<i>Thermoelectric and motorized actuators</i>		
Valve (2-point)	x	x
Valve (3-point)	-	x
Fan (on/off, 2-stage, 3-stage)	-	-
<i>Actuators with continuous control</i>		
Valve (constant)	-	x
Valve (6-way)	-	x

Universal Group Controller

Version 01.01
Status 01.01.2013

Network interface



Network variables

nviUGValue Input of the group
 Type: changeable
 Default type: SNVT_setting
 Range of values : Depends on nv type
 Presetting : 0/OFF
 {SET_OFF, 0.0, 0.00}
 Heartbeat control: Adjustable via
 SCPTmaxRcvTime

Configuration parameters

Parametrization of the network variables

SCPTnvType	Type definition of the network variable	SCPTmaxNVLength	Maximum length of the network variable (read only)
Type:	structured (SCPT #254)	Type:	unsigned short (SCPT #255)
Range of values:	Supported nv types	Presetting:	4 Byte {4}
Presetting:	SNVT_setting {0,0,0,0,0,0,0,0,117, NVT_CAT_REFERENCE, .4,0L,0L,0L}		

SCPTmax RcvTime	Maximum receive time for messages on <i>nviUGValue</i>	UCPTtimeout Value	Command for transmission failure
Type:	SNVT_time_sec (SCPT #48)	Type:	4 Bytes, format from <i>nviUGValue</i> (UCPT #141)
Range of values:	0,0 ... 6553,5 seconds	Range of values:	Depends on nvi type
Presetting:	0 seconds {0}	Presetting:	Depends on nvi type
UCPTpriority	priority/function of <i>nviUGValue</i>	UCPTcmdSpec	type of control on <i>nviUGValue</i>
Type:	enumerated (UCPT #68)	Type:	structure (UCPT #11)
Range of values:	-3 PRI_REMOTE external priority control -2 PRI_LIMIT limiting -1 PRI_NUL invalid value 0 PRI_AUTO automatic 1 PRI_MAN manual control 2 PRI_OVR1 override 1 3 PRI_WEATHER sunblind protection 5 PRI_OVRD2 override 2 6 PRI_SAFETY Safety	Structure:	typedef struct{ unsigned cmd_use :4 unsigned cmd_index :4 }
Presetting:	Depends on object type	Range of values:	.cmd_use 0 CMDU_DIRECT direct value 1 CMDU_LOCK lock command 2 CMDU_RELEASE release command 3 CMDU_LOW_LIMIT lower limit 4 CMDU_HIGH_LIMIT upper limit .cmd_index entry index of device parameter UCPTcmdTable, where the command for locking is defined (only for CMDU_ LOCK, CMDU_RELEASE)
		Presetting:	{0 0}

Parametrization of the object

UCPTftpIndex	Index of the used functional profile	UCPTconfig State	only used by Plug-in
Type:	unsigned long (UCPT #87)	Type:	unsigned short (UCPT #195)
Range of values:	65535 no profile 21400 LampActuator 22400 SunblindActuator 23400 DamperActuator 21202 BinaryInput 520 AnalogInput 521 AnalogOutput	Range of values:	-
Presetting:	No profile {65535}	Presetting:	-
		UCPTgroup Members	selection of actuator objects to control
		Type:	structure (UCPT #57)
		Range of values:	configuration via plug-in
		Presetting:	no object selected

SCPTdelayTime (maximum) forwarding
delay
Type: SNVT_time_sec
(SCPT #96)
Range of values: 0,0 ... 6553,5 seconds
Presetting: 0,0 seconds {0}

UCPTrndDelay specifies the use of
SCPTdelayTime
Type: boolean
(UCPT #67)
Range of values: 0 FALSE use as absolute
delay
1 TRUE use as
maximum delay
absolute delay
is a random
value within the
maximum
range
Presetting: FALSE
(absolute delay)

5.5. Glossary

AC	alternating current
ASK	amplitude shift keying
DC	direct current
DECT	digital enhanced cordless telecommunications
FTT	free topology transceiver
functional object	functional component of an device application
GSM	global system for mobile communications
hex	hexadecimal
ID	identification number
LAN	local area network
LED	light emitting diode
LNS	LonWorks network services
LON	local operating network
LonMark™	International organization with the intention to advance and bring forward the LON technology
Neuron-ID	individual, definite 48-bit device number
NV	network variable
Plug-in	Tool to configure, commission and log components of applications
Resource Files	files including definitions of interface components which can be used from network management tools to display and interpret the data properly
SCPT	standard configuration property type
SNVT	standard network variable type
SMI	standard motor interface
SMI-LoVo	standard motor interface for low voltage motors (24VDC)
TP	twisted pair
UCPT	user configuration property type
UNVT	user network variable type